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The Modern Walls of Jerusalem.

AFTER the disappearance of the Latin feudal kingdom of Jerusalem at the close of the thirteenth century, and the extension of the Egyptian Mohammedan government in the Levant, the famous city seems to have sunk into a very unimportant condition; no monuments of any size or architectural character can be attributed to the fourteenth and fifteenth centuries. The Christians must have been content with such ruins as they were permitted to occupy, and the Egyptians have left very few traces of their presence in the Holy City. This may partly be accounted for by the fact that during these centuries the capital of the district was once more constituted at Ramleh, on the great caravan route by Gaza, where, in the days before the Crusades, the Ommayedes had founded their centre of government. At the beginning of the sixteenth century Ramleh was falling into the decay in which we now see it, and Jerusalem was restored as a walled city, after two centuries of ruin. The "Aksa" or principal sanctuary of the "Haram" enclosure (this enclosure, occupying the ancient acropolis of the city, is usually known as the "Mosque of Omar") is probably the only monument of any size erected by the Egyptian Government. According to an inscription it seems to have been built, or rebuilt, by the Mamluke Sultan Mohammed *ibn Kalaun* in 1327. It is merely a very poor attempt to copy a Christian church; the materials are all second-hand, and the mode of construction and the few attempts at ornament are probably amongst the poorest and meanest examples of the Mohammedan style. At the north end is an arcaded porch recalling the design of a common Cairene type of mosque of the period. As an example of Saracenic architecture it is beneath criticism. One or two small monuments scattered about the Haram without order or arrangement also date from this time.

With the beginning of the sixteenth century came a very great change in the condition of Jerusalem. The Osmanli Turks, in the extension of their immense empire, took possession of Palestine, and one of the most important monuments of the reign of the first two Turkish rulers of Palestine is the singular, and in some respects magnificent, wall erected round Jerusalem (see lithographed plan in this issue). This imposing work evidently dates from the commencement of their rule in 1517, as the inscriptions on the north side of the city record the name of Selim I. Suleiman II., his successor, is perhaps to be credited with the greater portion of the work and its completion. The dates on mural tablets inserted in various portions of the wall range over a period of about twenty-five years. At this time the Ottoman Empire was attaining its most splendid development, and the retreat of the Knights of St. John from Rhodes in 1522 marks perhaps its greatest victory over the Western nations. Fifty years later the battle of Lepanto put an end to all Turkish advance westward, and heralded the decay which is associated with the Turkish name at the present day.

The innumerable voyages, travels, and histories written by pilgrims of the sixteenth century on their return from their perilous journey to the Holy Sepulchre naturally contain many references to this then new wall. These worm-eaten volumes may be found on the dusty shelves of all the older European libraries, and a few extracts from them will suffice to give some idea of the Holy City in those days.

Ludovico degli'Agostini, of Pesaro, wrote an account of his pilgrimage about 1550 for the Duke of Urbino. He describes the new wall of Jerusalem as the finest to be seen in the whole world. It was built of fine white stone properly squared, and decorated with merlins and many turrets, &c. As in many Turkish cities, there was also a fine castle which reminded him of that at Ferrara. The wall was built by Sultan Suleiman, in accordance with his father Selim's intention, as an *ex voto* to the holy Mohammedan city. Selim, in his victorious progress through Syria on the way to Egypt, had camped outside near the gate of St. Stephen or Bab Sitti Mariam, and here he meditated the complete destruction of Jerusalem. But his intentions were changed in consequence of a dream in which he seemed to see the Holy City being devoured by two lions. Instead of destroying it he determined on surrounding the holy places with the present magnificent wall; but he seems to have desired it should not be prepared for artillery. Before leaving Jerusalem he presented rich gifts to the inhabitants, including the Christian communities. The story of the vision of two lions is supposed to be commemorated in the two very conventional attempts to represent such animals which may be seen over the arch of the Bab Sitti Mariam. The Sultan's decision not to regularly fortify the town originated in the policy of previous Mohammedan rulers, who, for fear of having a strong fortress within their borders, which the Christians would desire to secure, had always destroyed the mediæval walls whenever they became masters of the city.

In the middle of the sixteenth century Jerusalem was supposed to contain 15,000 inhabitants within the new wall, which was about three Italian miles in circuit. The guard, called "Tambracanò" was changed every six hours to the sound of drums and fifes, and this served for a sort of clock in addition to the call of the muezzin from the minarets, bells being, of course, out of use.

The Seigneur de Villamont, who visited Jerusalem in the latter half of the sixteenth century, was surprised to find the city gates without any *pont-levis* or outworks. At the entry of the château were a number of cannon, some in bronze, others in iron, "qui sont braquées pour la défence de la porte." The château was of great extent, similar to those in Italy, but "sans aucunes tours, fors une bien haut élevée, et en forme

de donjon, qui sert pour faire la sentinelle." Evidently this château, or "Castrum Pisanum," as it was known all through the Middle Ages, has been added to since the sixteenth century, for at the present day there are two or three very distinct towers in its construction.

Quaresimus, "Guardian of Mount Sion," at the beginning of the seventeenth century, hardly mentions the city wall in his voluminous "Elucidatio Terræ Sanctæ." He merely states its having been built by Suleiman, and the legend that the architect had his head cut off at the conclusion of the work (a convenient mode of settling his commission), because he had excluded the portion of Zion on which the Cenaculum stood. Quaresimus also gives the Hegira dates, which were inserted at different points on the wall in small stone tablets, as follows :—

St. Stephen's Gate	(A.D. 1516)	A.H. 921
Gate of Flowers	(A.D. 1539)	A.H. 944
Damascus Gate	(A.D. 1539)	A.H. 944
Sion and Dung Gates	(A.D. 1542)	A.H. 947

The materials were partly quarried for the purpose, but Christian buildings furnished the greater part. The Minorites were expelled from the Mount Sion Convent in 1549 (Gesta Dei per fratres Minores), but they only occupied the modern convent of S. Salvator in 1559.

Francis I., King of France, seems to have exerted himself on behalf of the dispossessed Minorites, and an interesting brief on the subject addressed to him by the Sultan Suleiman has been published in various books on this chapter of history. The Jews were accused of intriguing with the Mohammedans to turn the Franciscans out of the Cenaculum, who, after their expulsion, were condemned to remain outside the city for years, exposed to the attacks of Arab marauders.

The voyage of the French Ambassador, M. d'Aramon in 1547 contains some references to Jerusalem. His arrival outside the walls of the city is described, and the way in which he was met by all the notables, escorted by a large body of arquebusiers. The city is described as having been enclosed with walls by the Turks, but its aspect seems to have been disappointing. The streets being uninviting and apparently in ruins, the arcades, which had anciently covered them and permitted of one's passing about the city dry-shod in wet weather, had fallen down. The market was near the Porta Speciosa. M. d'Aramon seems to have been chiefly impressed by the ruinous condition of the interior of the city.

An old semi-devotional description of the Holy City at this period was written by Fra Bonifazio Corsetti in 1553. It is called "Liber de perreni cultu Terræ Sanctæ," and contains some curious particulars. From this it would appear that the ancient wood doors of the Golden Gate were removed at the time of rebuilding the walls, and they were presented to the Franciscans as a relic, and placed in the collection of relics preserved in the Church of the Holy Sepulchre. About this time the annual commemoration of Christ's supposed entrance by the Golden Gate, which was celebrated by a procession of the Franciscan monks from Bethphage to the Cenaculum through the valley of Jehosophat, was discontinued.

A sort of guide-book for pilgrims, written by Fra Noe, of the Franciscan Order, of uncertain date, but apparently of about the middle of the sixteenth century, states that nothing remained of ancient times except the Golden Gate and some antiquities in the church of the Franciscans of the Cenaculum. The only important fragment of earlier Jerusalem left in the course of reconstructing the mediæval walls in 1516-1542 was the Golden Gateway. This most interesting late Roman monument does not come within the range of the present notice, except in as far as it affords a singular contrast with the characteristic mode of constructing gateways of Levantine cities during the Middle Ages. The old Roman gateway was with two side-by-side archways, with a straight cut through the wall, much in the way of the gates of Aurelian's wall round the capital. In the sixteenth century the Turks had a very different mode of constructing the entrances to their castles and cities. Rey, in his "Colonies Franques de la Syrie," draws attention to the great difference in style of design between the Christian and Mohammedan fortresses, and it is curious to find that which he identifies with the Mohammedans (and also with the buildings of the Order of the Temple) surviving at a period about three centuries after the Crusades. In nothing is this curious survival more noticeable than in the mode of constructing the city gateways. In the Mohammedan style the gateway, instead of being a simple archway defended by one or more portcullis, a drawbridge over a moat, a barbicane, &c., as in European fortresses, is always planned on a crooked principle, by which the assailants, after forcing the outer gate of wood and iron, found themselves inside a vaulted passage turning either to the right or left, at the end of which was another heavily constructed gate. By this system the assailants were trapped in a small space and at the mercy of the defenders of the fortifications, who could kill them off through loopholes arranged for the purpose. It will be noticed that all the gates of Jerusalem except the "Golden Gate," which was preserved by the Turks as traditionally built by Solomon the Wise, are planned on this principle, a system evidently found sufficient for the purposes of Eastern warfare before the introduction of more scientific gunnery in the seventeenth century. Such a plan for a gateway almost prohibits the entrance of wheeled vehicles into a town, and until the last few years, when the Bab Sitti Mariam and the Jaffa Gate were altered for the purpose, Jerusalem was almost impracticable for carriages, the only entrance to the city large enough for such a purpose being the Damascus Gate, which still remains in the condition in which it was first built, and still affords an opportunity for the Arab "Arbughi," or coachmen, to display their skill in turning corners with the modern carriages, which nowadays have taken the place of horse litters. All the gates of Jerusalem are decorated with scraps of mediæval carving gathered from the ruined Christian churches, and used up in a meaningless manner. Capitals of columns stuck into the walling as brackets, archstones over windows which they do not fit, and odds and ends scattered about on the principle of shell grotto architecture, have a grotesque appearance. Such ornaments as seem to have been cut expressly for the position they occupy are of the most meretricious character. And here it may be noted that all over the walls as well as on the gateways a feature presents itself peculiar to the Levant. In the true mediæval fortresses it was the custom to utilise the granite, marble, and stone columns of the old Romano-Greek cities such as Cæsarea, Jerusalem, Askelon, &c., as bond stones in the thickness of the walls. They seem to have been specially adapted to resist the effects of mining and battering. In the sixteenth century walls of Jerusalem this older style of construction has been imitated with a very curious result. But at this period the supply of columns must have come to an end, or the mere appearance of such a system of building was thought sufficient, and so Suleiman the Magnificent was content with a series of round *patera* dotted over the surface, each one of which is generally carved with a different design of the usual interlacing Arabic style, and slightly projecting from the wall to represent the section of column. The result is as unsatisfactory as such a tawdry sham might naturally be expected to produce, and adds to the unreal character of the work as fortifications.

Jerusalem, since the Middle Ages, has never been provided with any regular trenches or other usual elements of fortification. Merely this imposing wall, three miles in length, and of an average height of about 30 ft., has formed for three centuries and a half an enclosure to the Holy City. Since it was built the city has only once been subjected to a hostile attack, and that from the very Turks who built its wall. In 1825 the inhabitants endeavoured to resist an imposition of taxes, but were quickly persuaded in the matter by a slight bombardment.

SCULPTURE AT THE ROYAL ACADEMY.

IT can hardly be said that there is any great work in sculpture in this year's Academy. Of the colossal seated statue of the Queen by Mr. Onslow Ford we have already spoken. As a monumental statue it is broad and dignified in treatment, but we can hardly regard this class of work as fulfilling the highest aims of sculpture; still less the large bronze realistic figures of Cromwell and Dean Hook, by Mr. Pomeroy. It is to be supposed that people will have statues of this kind, but it is rather regrettable to see an artist of Mr. Pomeroy's attainments engaged upon them, when he might be so much better employed.

Taking the other works in the octagon in the order of placing, we come first on a piece of decorative work by an Italian artist, Signor Sortini. This is a model of a bell covered with bas-relief subjects, which are well treated in themselves, but the bell is the wrong shape and proportion for producing tone, being too high and narrow in proportion, and a worse fault is that the hanging loop is formed by figures of angels, which are thus put to a function for which they are quite unsuitable, and which is a degradation of the figure from being a source of expression to acting as a mere mechanical connexion. Mr. Toft's "Spirit of Contemplation" represents a nude female figure seated in a rather too

"May Morning"—Relief for Decoration of a Fireplace. Miss Edith Maryon, Sculptor.

cramped attitude in a chair, which latter is a good piece of design; the figure has not the dignity either of design or expression which the subject seems to call for; but it is at all events not commonplace. Mr. Pegram's monument to Mme. Michallis seems to have been inspired by some of the monument designs of Chapu and Mercié; it shows a simple but well-designed flat stele or tombstone, in the head of which is a medallion portrait of the deceased person commemorated, while beneath is a mourning figure, life size and draped, in high relief on the stele as a ground. There is pathetic intention in this, but in a sculpturesque sense the figure is somewhat commonplace in design, and appears more so from the rather pronounced alto-relief in which it is treated. A French sculptor would almost certainly have kept it in low relief, perhaps just emphasising the head by raising it further from the ground; such a treatment would have tended to give a refinement of sculpturesque effect which the work as it stands seems to lack; it is altogether too *prononcé* and too crude in its large rounded forms.

In Mr. Arthur Walker's recumbent group, "Sleep," representing a mother and child, the sleeping infant is natural and touching in expression; the attitude of the figure of the mother, with legs drawn up, is rather awkward and undecorative in line, but the work as a whole is one to be regarded with interest, and is in a very good style, free in execution and not over-finished. Mr. Fehr's "Hesitation," a bronze figure of a female tempted by "Ambition's crown," yet shrinking from putting it on her head since it is "fraught with pain," is one of those symbolical subjects which are peculiarly suitable for sculpture, but the interpretation is a little too matter-of-fact and prosaic—the figure holding up the crown and twisting her head away from it as if it would sting, looks so like a shrinking from bodily pain, besides resulting in an uncomfortable and strained attitude; the *motif* of the work should surely have been conveyed through the expression of the face rather than through muscular movement. Mr. Lucchesi's "The Victory of Peace," to be erected in marble in a Park at Auckland, is a half-draped female figure of fine lines clasping a dove on her bosom but also holding in the other hand a drawn sword, so that the allegory is rather confused, and one can only regard the work as satisfactory from a decorative point of view. Mr. Alfred Turner's short-skirted and robust "Fisher Girl," one of a pair to be placed in Fishmongers' hall, is not decorative, but is a good healthy symbol of open-air physical toil. Mr. Thornycroft's "Dean Colet, Founder of St. Paul's School," with a scholar kneeling on each side of him, is the group to be placed under the not very happily designed metal canopy of which the drawing is shown in the architectural room. The sculptor is here helped, in treating the principal figure, by the flowing costume which is not of to-day, and which therefore has a certain sculpturesque and abstract effect; Colet's thin and ascetic head is finely treated, and the innocent and unworn faces of the boys make an effective contrast with his figure. The last thing we have to mention in the octagon room is the nude marble figure "Solitude," by a French sculptor, M. Mégret, of which an illustration will be found in one of the plates in this issue. The figure has not the sentiment implied in the title; indeed, any name such as "Nymph" or "Etude" would do equally well for it; but it has the merit of being an exceedingly pretty and well-modelled figure, which would have had more justice done to it by a central position, as it seems satisfactory in line from all points of view.

In the Lecture-room we may first notice M. Schenck's two alto-relief subjects, "Summer" and "Autumn," which are placed against the wall over the door, and of which, as they are in a special sense architectural sculpture, being intended for the decoration of a building, we have given illustrations on a large scale (see lithograph plates). As will be seen, they are figures composed specially to fill a space of peculiar shape, and also to act as corbels. This latter function explains and justifies their high relief; otherwise we prefer decorative sculpture on a building to be kept in low relief, in order to be duly subordinate to the architectural lines of the building.

The works placed in the centre of the floor in the lecture-room are at all events curiously diverse in style and motive. In the centre of the room is the bronze of Mr. Swan's "Puma and Macaw," of which a plaster model was in a former exhibition. As a representation of animal form and action this is a remarkably truthful and spirited work; what one questions is whether the result is really worth the ability and pains expended on it; for animal sculpture can never take anything but a secondary rank in the productions of the art; it lacks the higher interest of intellectual meaning and expression. Mr. Simonds's curious design for a fountain, called "Song and Dance," is original and piquant enough; it is based on a triangle plan, and consists of a gilded nude figure placed aloft in the centre and playing on an old-fashioned bow instrument, while three flamingoes dance solemnly at the three angles of the triangle. No doubt the subject arose from a wish to work into sculpture the peculiar form and movement of the flamingo, an experiment which was worth trying, though one fails to see what connexion the birds have with a fountain. It is a graceful and original fancy, however; we should have liked it better if the centre pedestal had presented a formal design and not a piece of naturalistic rockwork; and there is nothing to show whence the water flows, an important detail in a fountain, and which should always form a point in the design. Mr. Frampton's "Edward VI." is a realistic costume statue for Giggleswick School, with the foundation of which we presume the young King had some connexion, and which is intended to represent him in his habit as he lived, with the stiff frock covered with embroidery. For a school this is the right thing, as it gives the boys a correct historical idea of the person and dress of a historical personage, and the sculptor has contrived to impart a good deal of individual character to the head; it cannot be said, however, that this is a kind of work which is interesting as sculpture. Mr. Wheatley's recumbent figure "Awakening," of which a small illustration will be found in one of our plates, is a work of considerable interest; it represents a nude female figure, who by the design of the small harp by her side and of the ornament on her forehead is to be classified as Egyptian, though there is nothing in her physiognomy to suggest that nationality; she is just awakening with a smile, her disordered hair partly covering one side of the face; the figure, in its lax attitude of repose, is very well modelled, and there is something very pleasing about the whole work, though it is not conceived in a very serious spirit.

Mr. Reynolds-Stephens's "Castles in the Air" and Mr. Onslow Ford's "Glory to the Dead," which are placed symmetrically on opposite sides of the room, may in one sense be classed together, as they both represent that kind of work which is as much decorative as purely sculpturesque; both are small bronze figures on specially

treated pedestals. In "Castles in the Air" the figure of a young girl with a book across her knee, not reading but dreaming, and with the right hand slightly raised in a very pretty and natural action, belongs essentially to real life; the pedestal is symbolical, the projection which forms the cap being decorated with little projecting turrets each with a bit of ruby glass in the top; the "castle" idea is again symbolised in the crowning ornament of the plaque which forms a background to the figure. Mr. Ford's work, though as we said, it belongs to the same class, is a far more delicate and refined production; the nude figure holding the wreath and torch is of exquisite grace and finish; the bronze pedestal which forms her immediate support is surrounded by little terminal figures of winged children, and small and delicately executed emblems—hearts, serpents, &c. This stands on a well-designed marble pedestal with fluted pilaster-like features which are stopped at the foot by acanthus leaves. As an *objet d'art* with a symbolical intent the whole is charming, but is it quite equal to the serious thought suggested by the title? When one thinks of Mercié's "Gloria Victis" in the court of the Paris Hôtel de Ville, one feels this to be rather small in comparison, and that not only in the sense of material dimensions.

Mr. Brock's bust of Queen Victoria, which stands between the two last-named works, is a masterly piece of protraiture in marble-cutting, bold and broad in execution and exceedingly dignified in character. Mr. Armstead's small-scale marble figure "Remorse," a woman running headlong down some steps with a woeful expression and attitude, the head and body thrown forward and the hands clasped convulsively, is pathetic in expression but rather violent in movement for sculpture. Mr. Colton's "The Wavelet," a gilt figure of a young girl supposed to be looking down on a stream, is clever and original, like all his work, but not beautiful, and has hardly character or point enough to atone for the absence of beauty.

Of the works placed round the walls there are as usual a good many busts, some of no interest, others which are of value either as characteristic portraits or as ideal suggestions. Among the latter class are two charming works by Miss Gwendolen Williams: "Doris," a head oddly mounted on a narrow pedestal decorated with striated lines, and "Pandora," a more important work of which we give an illustration. This is rather too *genre* a treatment of a Greek legend, but the bright and joyous expression of the head, and Pandora's obviously happy unconsciousness as to the nature of the uncanny things she is letting out of the casket, give it a point and piquancy more than arises from mere modelling. Mr. Richard Garbe's "L'Inconnue" is another imaginary head, white marble on a veined marble base, of which we give an illustration, and which is noticeable both for its fine expression and for its style of execution. Among portrait busts may be specially mentioned Mr. Goscombe John's marble bust of a lady; Mr. Hope-Pinker's low relief medallion portrait of the late J. J. Tayler, in a small architectural frame of green marble, and Mr. Onslow Ford's medallion bas-relief of Lady Eliott Drake, framed in carved wood. Mr. Goscombe John's colossal bronze seated statue of the late Duke of Devonshire is a dignified work of this class, which, as before observed, is we suppose inevitable, but which can hardly make any sculptor happy.

Mr. Sargent appears this year as a sculptor, with a life-size crucifixion group, or rather a crucifix on a large scale, we presume intended for a Catholic place of worship, or a private oratory. The suggestion of the blood streaming from the outstretched hands into a cup held up by a figure at each side is to our thinking most painful and repellent, though we presume there are people of morbid religious excitability to whom it appeals. As a matter of design, the grouping of the two subsidiary figures with the Christ, to whom they are as it were connected by a band of drapery which winds round their figures and round His, is very fine, and the contrast of the lines of these figures and the strongly-marked vertical lines of the cross and the central figure is in a decorative sense very effective. Nevertheless, it is a thing we should never wish to see again. Mr. F. Lynn Jenkins's metal and ivory frieze for the vestibule at Lloyd's, which hangs below this, is a very clever and effective piece of work in which the associations of Lloyd's with sea and ships are symbolised in a decorative manner by the suggestion of ships and waves and clouds, with no kind of naturalism; the small alto-relief figures which are introduced at the salient points of the design are expressive and well designed. Among other decorative work in the Lecture-room is Mr. Mark Rogers's upper part of a cabinet in oak, of which we give an illustration; Mr. F. H. Steele's "Design for a Casket" in silver, which has the merit of avoiding that eccentricity of line and detail which seems too much an object in recent silver design, but for a casket it is perhaps a little too decidedly architectural in character; and Mr. Onslow Whiting's board of bell-pushes, finger-plates, &c., in which the figure is gracefully worked into some of the designs. M. Clovis Delacour's Andromeda statuette in ivory, with a bronze dragon, and waves of alabaster, is well done after its way, but is a kind of work we do not desire to see encouraged; it savours more of the "article de Paris" than of the art of sculpture. On the other hand, Miss Emmeline Halse's three little alto-reliefs of babies, in bronze, a small and very unpretending work, is by no means to be passed over; it is very clever and humorous. We should also mention the spirited panel in relief by another lady, Miss Edith Maryon, called "May Morning," and intended as a portion of the decoration of a fireplace. Of this we give an illustration from a small photograph sent to us by the artist; too small unfortunately to do justice to the work.

Although we have seen better sculpture years at the Royal Academy than this one, it cannot be denied that the proportion of good work to bad and indifferent is much higher in the sculpture galleries than among those devoted to painting.

NOTES.

City and Guilds Institute.

THE Report of the Council of the City and Guilds of London Institute, dated April of the present year, draws attention (in the special Report of the Principal, Professor Sylvanus Thompson) to the necessity for carrying out the completion of the College buildings first suggested in the Report of 1884. Plans were prepared by Mr. Robins in 1887 for additions to include an engineering drawing office, a library, reading room, waiting rooms and lunch room, and the Institute is now in possession of the site for which these additions were designed. As Professor Thompson observes, if the need for these additions existed sixteen years ago, it has certainly not diminished since. Mr. Sparkes's Report of the art work is very encouraging, especially as showing the after results of the training, for it appears that at the Paris Exhibition of last year, sculptors who were former students at the Institute obtained six of the English and Colonial awards for sculpture, viz.: one out of three Grand Prix awarded, two gold medals out of five, and three silver medals out of eight awarded. In the Art Department, we are told, the enamelling class is doing good work under the superintendence of Mr. Fisher, than whom there could not be a more competent instructor.

The Poultry Cross, Salisbury.

WE are glad to be able to announce that the resolution to "fluate" the Poultry Cross at Salisbury, which would have involved the initiatory process of scraping off all the lichen and getting a raw surface, was formally rescinded at the meeting of the Salisbury Town Council last week on the motion of Mr. Haskins, who made a very sensible speech on the occasion, and quoted in support the opinion of the Secretary of the Society of Antiquaries, Mr. Read. Of course, as we pointed out in a former reference to the subject, (page 336 *ante*), the Poultry Cross was so much restored half a century ago that it has ceased to be much of a genuine relic, though some of the old stones were worked up in the restoration. But as the portions then new have now acquired a picturesque weathering, this at least might as well be left.

The London Hospital.

AT a special court of the governors held on June 5, it was announced that the building of the new isolation block (towards which an anonymous donor gave 20,000*l.*) is now practically completed. The new buildings, together with the new pathological department and *post mortem* room, have been erected after the plans and designs of Mr. Rowland Plumbe, who has been engaged during some years past as architect for extensive improvements and additions at the hospital. The governors propose to expend a total sum of about 250,000*l.* during the next four years, of which amount they will devote 60,000*l.* to the new block fronting Whitechapel-road; for the Jews' wards they set aside 10,000*l.* contributed by Mr. Edward L. Raphael; for a new out-patients' department, 60,000*l.*; laundry, 15,000*l.*; alterations of the interior, 20,000*l.*, and a children's ward, 7,000*l.* Mr. Rowland Plumbe's work comprises the block, opened on June 26, 1891, which contains an operating theatre, a theatre for clinical instruction, students' rooms and lavatories, nurses' rooms, storerooms, &c.; the recent remodelling of the sanitary arrangements, by the recommendation of Dr. Louis Parkes; an extension of the Nursing Home (1895); and the freezing chamber. The hospital was originally established in 1740, as the "London Infirmary," at a house

in Prescot-street, Goodman's Fields. Having been incorporated in 1758, it was removed to its present site next eastwards of "the Horn-work" or "Mill Mount," one of the earthworks thrown up in the winter of 1642-3, when the King's headquarters were at Oxford. In 1781-3 the buildings were enlarged by James Spiller, and subsequently by Wood, and John Robinson. The "Alexandra" wing, for seventy beds, was added in 1864; in 1876 Queen Victoria opened the "Grocers'" wing, the accommodation being thus raised to a total of 776 beds.

Open-Air Pulpits at London Churches.

ON Friday last week the Archbishop of Canterbury dedicated an open-air pulpit, which has been erected at a cost of 200*l.* in the graveyard of Christ Church, Spitalfields, (Hawksmoor, 1714-29), as a memorial of the late Dr. Billing, Suffragan Bishop of Bedford for the East End of London, who was rector of the parish for a period of ten years. The old open-air pulpit-cross, where the Spital Sermons used to be preached, was pulled down in the course of the Civil War. It had been rebuilt, 1594, in the place of one which stood in the churchyard—since Spital-square—of the Priory Hospital founded at the close of the twelfth century by Walter Brune and his wife Rohesia, and dedicated to Christ and the Virgin Mary. There are three other open-air pulpits in London: at St. Bartholomew Church, Bethnal Green (Railton, 1843-4); St. Mary Matfelon, Whitechapel (E. C. Ayton-Lee, after the fire of August 26, 1880), built in memory of Dean Champneys, who had been rector during twenty-three years; and, in 1892, in a window in the south wall of Holy Trinity Church, Marylebone-road (Sir John Soane, 1824-8), erected as a memorial of Canon Cadman, a former rector of the parish.

Flow of Water in Curved Pipes.

IN the May number of the "Proceedings of the American Society of Civil Engineers" will be found an exhaustive paper recording the results of a series of experiments, commenced in 1893 and continued until 1899, by the chief engineer to the Board of Water Commissioners of the City of Detroit, Mich. The purpose of the investigation was to determine the effect of curvature upon the flow of water in closed circular conduits under pressure, and particularly to examine the effect of changes in radius of curvature upon the losses of head in those cases occurring in ordinary waterworks distribution systems. As the paper covers nearly two hundred pages, and includes numerous tables, figures, and plates, we may reasonably abstain from detailed discussion of its contents, and pass on to the most important of the various demonstrations which they afford. The experiments, taken as a whole, appear to prove beyond question that hitherto accepted ideas of the laws governing curve resistance are wholly in error. The resistance due to curvature is shown to be very much less in short than in long radius curve, for the same total length of pipe and angle of deflection. From many experiments upon a 30-in. and a 12-in. pipe, it is apparent that the 90 deg. curve involving the least resistance in a total length of 80 diameters is one between 2 and 2½ diameters radius. This result—or perhaps we ought to say discovery—is sufficiently startling, and, presuming the accuracy of the observations, its meaning is that the theory and practice regarding curve resistance, as set forth in the hydraulic treatises of all nations up to the present time, are absolutely inaccurate, and are diametrically opposed to the true conditions. The authors do not profess by any means to have exhausted the subject, and as their investigations merely refer to curves of 90 deg., and do not extend to the long radius curves occasionally used, there is ample room for further inquiry.

Edison's Storage Battery.

THE *Electrical Review* published last week the paper which was recently read to the American Institution of Electrical Engineers by Dr. Kennelly describing a novel storage battery invented by Mr. Edison. This new cell is a very distinct advance on anything that has hitherto been done, and if Mr. Edison can supply it, as he says he can, at the same price as the ordinary lead storage cell of commerce, it will revolutionise many of our methods of electric traction. In practice a good lead battery can be got which will give a horse-power per hour at its terminals for every 150 pounds of its weight. It is stated that the Edison cell gives a horse-power per hour for every fifty-three pounds of its weight, an advance which is in itself quite sufficient to make electric traction for motor cars a commercial success. It will be remembered that the London Electric Cab Company failed because the batteries were ruined by being allowed to run down too far. Dr. Kennelly states that this new cell can be allowed to run down until there is no charge left in it without doing it any harm. In fact, a cell has been discharged and then charged up in the reverse direction without doing it any real damage. The negative pole, that is the one corresponding to the zinc of a primary battery, is iron, and the positive pole is a special superoxide of nickel. It is therefore a nickel-iron cell. The positive and negative plates of the battery are mechanically alike. They consist of plates made of thin sheets of steel 0·024 in. in thickness, out of which rectangular holes are stamped. Each opening is filled with a shallow perforated steel box nickel-plated containing a briquette of the active material. The plates are finally placed in a 20 per cent. solution of potassium hydroxide contained in a vessel made of sheet steel. This electrolyte does not attack any of the parts of the cell, nor are any of the ingredients forming the briquettes soluble in it. The electro-motive force of the cell when fully charged is 1·5 volts, and it is stated that it can be charged in an hour, although the most economical rate of charge is three and a half hours. There is no more important problem at the present time in connexion with electrical engineering than the invention of a light storage battery, and Mr. Edison's invention has naturally aroused the greatest interest.

Art for Schools Association.

THE Art for Schools Association has just issued its Annual Report for 1900. The work of the Association, as many of our readers are aware, is to supply elementary schools with good prints and photographs of beautiful and interesting works of art, with the idea of interesting children in pictorial art, and thus prepare the way for the work already being done by loan exhibitions of pictures in poor districts of London and other large towns. The Association supply these schools at prices allowing a mere nominal profit, and they have, therefore, in order to secure a regular income, started a publishing business supported by annual subscribers, who receive, in return for their subscriptions, copies of all the publications of the Association. These publications are issued annually, and consist of historical subjects, studies of natural objects, and reproductions of standard works of old masters. The usefulness of the Association depends largely on the number of annual subscribers, who by their help enable it to respond to the increaing calls of numberless schools which are anxious to avail themselves of these publications. The number of these sold last year was nearly 5,000.

Fine Art Society's Gallery.

THE water-colour drawings by Mr. Arthur Severn, at the Fine Art Society's Gallery, form an interesting collection, some of them very beautiful. A considerable proportion of them may be classified as studies of special effect in landscape. Thus we have "Abbeville by Moonlight" (13), a very moonlight effect except that the towers of the church, with the moon behind them, show rather too much colour for moonlight—this seems to have been purposely done to enhance the cold tone of the moonlit portions of the scene. "Sun effect Cumberland Coast" (23), is good, but open to the objection that the sun is far too large in scale; "Sunset Cloud over the 'Old Man,' Coniston" (28), is fine; "Rain Cloud effect at Sunset, Trouville" (32), and "Early Morning, Cannes" (37), seem rather exaggerated, but may not be so. The finest drawing in the collection is, to our thinking, "Cumulus at Sunset, Cumberland Coast" (18). One or two sea studies, especially "Sea at Alassio," are very free and effective. The "Drawings of Birds and Animals in Motion," by Mr. J. Guille Millais, in the same gallery, are not very artistic in quality; they impress us rather as the observations of a keen sportsman with a talent for drawing, and are in that sense interesting, though disappointing as works of art.

The Modern Gallery.

AT the Modern Gallery, 175, Bond-street, is a collection of water-colour drawings by Mr. and Mrs. Albert Stevens—"Gardens at Home and Abroad" and "Sunshine and Shadow in Foreign Lands." The collection includes 130 drawings, many of them of great merit, showing a broad style of work and a good perception of colour effect. The large drawing "In the Olive Woods Cap Martin" (122), by Mr. Stevens, is an admirable work; and many others may be studied with pleasure; we may mention especially Nos. 20, 32, 39, 66, and 69. The work of the two artists is distinguished by the letters "A.S." or "M.S." in the catalogue. We must confess that the artistic honours seem to rest with the gentleman rather than with the lady; at least, we find that nearly all those we had marked as especially good bear the "A.S." initials; but Mrs. Stevens's "Old Vicarage Garden, Norfolk" (7), is an exception, and is a charming bit of colour.

ADDITION TO NEWHILLS CONVALESCENT HOME, ABERDEEN.—Tenders have been accepted for a new wing for sixteen consumptive patients — a new branch of treatment at the institution. Mr. George Coutts, Aberdeen, is architect.

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THE SAFETY OF ST. PAUL'S CATHEDRAL.

AFTER many years conflict with vested nterests and other inimical forces, the tubular railway system has become an accomplished fact and a popular institution. Apart from criticism upon some matters of detail, nothing but praise was awarded to the two first electric subways of the metropolis. When the third was finally opened for traffic, and numerous Bills were deposited for the consideration of Parliament relating to further undertakings of the kind, the inhabitants of London began to feel assured that the true remedy for congested traffic had at last been placed within reach. Moreover, there appeared every reason for believing that the remedy would be unattended by disadvantages, such as sometimes attend the employment of therapeutic agents in the practice of medicine. The solid bed of clay underlying the metropolis to a depth of some 400 ft. was almost universally regarded as affording an ideal matrix for the production of innumerable underground railways. It was assumed that the stiff and tenacious nature of the material would permit of endless burrowing, and that the restless activity of the busy hive below would be unheard and unfelt at the surface. It was with sincere regret that we found reason to doubt the accuracy of the latter assumptions. First came complaints from residents along the line of the Central London Railway of undue vibration and noise, and then suggestions that the stability of buildings might be seriously affected by the same undertaking. Some of us were possibly inclined to regard the contentions of property owners as somewhat fanciful, and no doubt the advocates of such were in duty bound to present their cases in the most forcible manner, but no one now denies the fact that undue disturbance has followed the construction of the railway. Eminent authorities attributed this unfortunate result to defects in the design of the rolling stock, and in the construction of the permanent way, and consoled us by the hope that when these faults had been remedied there would be no further cause for anxiety. Nevertheless, we believe the travelling public must be prepared for an access of watchful opposition on the part of the property owning public to all new lines projected beneath the metropolitan area. Perhaps one of the most serious of the evils apprehended is injury to the historic buildings to be found in various parts of London. Already it is the fact that the spire of Bow Church, in Cheapside, is nearly two feet out of the perpendicular, and this deviation is attributed to excavations in connexion with the Central London Railway. The accuracy of this view has not yet been established, but the fact that it is seriously advanced is sufficient to prove the uneasy feeling that exists with regard to low-level lines in the metropolis. Bearing in mind the previously considered points, we can quite understand the anxiety entertained by the Dean and Chapter of St. Paul's Cathedral as to the possible effects that might attend the construction of the proposed City and Piccadilly Electric Railway. Archdeacon Sinclair, who has doubtless had the benefit of technical advice, recently said that as the soil under Ludgate-hill and the immediate neighbourhood is chiefly made up of loose gravel and sand, any excavations which would tend to drain off the underground water, would, in all probability, cause a crack in the extensive block of concrete upon which the Cathedral rests. In such an event, the authorities believe a collapse or a settlement of the building might result, and the example presented by the Church of St. Mary-le-Bow in no way tends to allay their apprehensions. We observe that the promotors of the new line make the announcement that a deviation will be made in the vicinity of the Cathedral so as to ensure the avoidance of possible injury; but if there is to be any excavation, tapping underground springs at a lower level, the diversion could hardly possess the anticipated virtue.

Our readers will no doubt remember that the pioneers of low-level railways have always spoken of the London clay as a stratum, impervious to water, in which tunnels might be cut as safely and easily as a mite eats its way through cheese. The fact is, however, that the tunnels of tubular lines are not invariably driven at a level where continuity of the clay can be assured. Trouble has before now been caused by the presence of water, coming down through faults in the clay or met with during occasional penetration of the overlying beds of sand. In such cases, it would naturally be futile for the engineers to attempt draining off the underground water in the manner apparently suggested, or feared, by the authorities of St. Paul's. No engineer in his senses would dream of such a thing, and, as our readers are well aware, operations are conducted in all cases of the kind by the aid of compressed air until the springs are permanently sealed by the finished tube with its impervious grouting. Very likely the proximity of a subway to the upper edge of the clay may tend to accentuate vibration under certain conditions, but we cannot understand how any settlement can be caused so long as the tube remains intact and dry.

The methods adopted by coal and salt miners are constant sources of inconvenience in the North of England, but similar practice does not enter into the philosophy of the deep-level railway engineer, and it is very difficult to understand how injury to surface buildings may be expected to result from his work. At the same time, it must be remembered his operations are conducted in an unknown and unexplored land, where unexpected problems may arise to baffle the most carefully-laid plans. At no distant date we may expect to find the question discussed fully, and we shall then know better than at present how far the fears of the Dean and Chapter may be justified, and whether the safeguards proposed by the railway company may be looked upon as entirely satisfactory.

THE INTERNATIONAL CONGRESS OF FIRE BRIGADES AT BERLIN.

ON Thursday, the 6th instant, the International Congress of those interested in fire brigade work and cognate subjects, which has been organised by "Le Grand Conseil International des Sapeurs Pompiers," was opened at 10 a.m. by a formal and ceremonial meeting under the Presidency of the Minister of the Interior, at the Imperial Houses of Parliament. The House of Representatives in which this meeting, as well as the subsequent business meetings of the Congress, was held could only accommodate a small proportion of the 2,000 members attending the Congress.

After formal addresses of welcome and thanks by representatives of the various nationalities present, the following papers were read—(1) "The Relations between Fire Brigade Work and Building Regulations" by Fire Brigade Inspector Kleber, of Stuttgart; (2) "The Automobile Traction of Fire Engines" by Captain Cazier, of Creil, France, Vice-President of the "Grand Conseil des Sapeurs Pompiers;" (3) "The Organisation of the British Fire Prevention Committee and its Investigations with Fire-resisting Materials" by Mr. Edwin O. Sachs, Chairman of the British Fire Prevention Committee; (4) "Smoke-resisting Apparatus" by Captain Welsch of the Fire Brigade of Ghent.

In the afternoon a visit was made to the highly-interesting and well-organised works of the General Electrical Company, in whose two factories (connected by an underground railway) over 6,000 men are employed in the manufacture of electrical apparatus.

In the evening a formal dinner, attended by about 400 members, was held in the restaurant of the "International Exhibition of Fire-prevention and Fire-combating Appliances," an exhibition organised in connexion with the Congress, and of which we shall give a detailed description in a future number.

On the following day, Friday, the 7th inst., the Congress resumed work at 9 a.m., and the following papers were read:—(1) "The Participation of Fire Insurance Companies in the Cost of Fire Protection Generally," by Fire Brigade Inspector Krameyer, of Merseburg. This led to an animated discussion, after which a resolution was carried by a large majority affirming the desirability of fire insurance companies being compelled by law to contribute towards the expense of maintaining fire brigades, a decision by no means surprising seeing that almost every one of those present was a member of a fire brigade, that socialistic opinion is strong in Berlin, and that municipal insurance, rather than underwriting by public companies, is a considerable element in Germany, where, indeed, it may be said that fire insurance companies are to-day fighting for their lives with the odds, in public opinion, heavily against them. The remaining papers were (2) "Remarkable Fires in Russia, and the Question of Fire Extinction and Water Supply in Extremely Cold Weather," by Lieut.-Colonel E. von Lundh, Fire-Brigade Major, of Odessa; (3) "Fire Protection in Warehouses," by Fire Brigade Director Ruhstrat, of Stettin; (4) "The Development of the Carbonic Acid Fire-engine and its use in combination with Steam Fire-engines and Hydrants," by Fire Brigade Director Dittmann, of Bremen; (5) "Electric Lighting Installations as the Cause of Fires, and their Comparison with other Lighting Systems," by Signor Ugo Penné, First Lieutenant of the Milan Fire Brigade; (6) "The Use of Small and Large Hose," by Captain Müller, of Vienna; (7) "Fires on Board Ship and Cotton Fires," by Fire Brigade Officer Prölss, of Hamburg.

The social functions of the Congress for this day comprised a visit in the afternoon to the Royal Palaces; a fire brigade parade in the courtyard of the head fire station, where the methods of training firemen and of turning out on receipt of a call were illustrated; and in the evening a popular concert in the Zoological Gardens. There were besides several semi-private dinner parties, including that given by Mr. E. O. Sachs and the Executive of the British Fire Prevention Committee at the Hotel Bristol, which included amongst the guests the British Ambassador, Sir Frank Lascelles; Herr Hinckeldeyn, Director of Public Works, the Prussian Ministry of Works, President of the Berlin Architekten-Verein; Captain Gamble, of the London Fire Brigade; Major Fox, of the London Salvage Corps; Herr Westphalen, Chief Officer of the Hamburg Fire Brigade; Herr Dittmann, Chief Officer of the Bremen Fire Brigade; Herr Müller, Chief Officer of the Vienna Fire Brigade; Herr Meier, Chief Officer of the Amsterdam Fire Brigade; Count Komarosky, of St. Petersburg; and Count Fernandez, of Oporto.

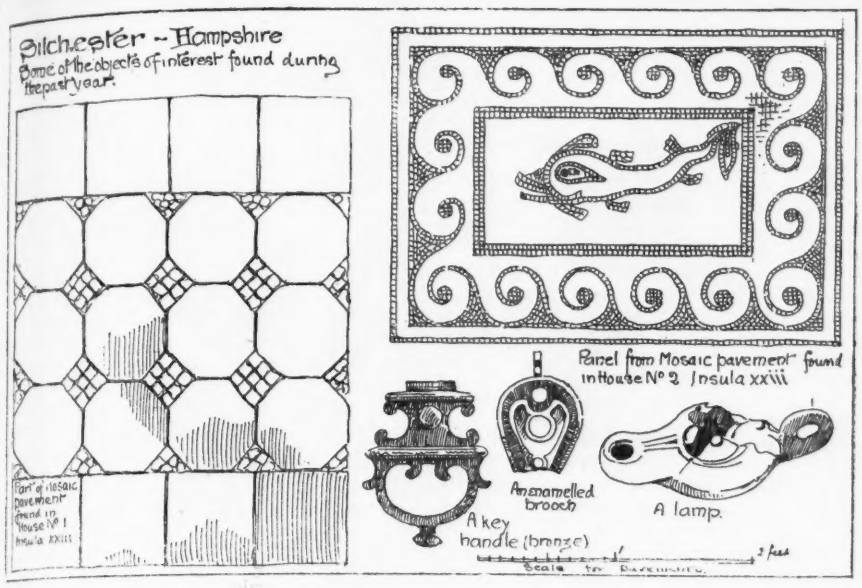
On Saturday, the 8th instant, the following papers were read (1) "The Benevolent Funds of the German Fire Brigade Unions," by Fire Brigade Director Weigand, of Chemnitz; (2) "Spontaneous Combustion," by Professor Dr. Madem, of Greifswald; (3) "Fire-resisting Construction and Materials," by Fire-brigade Director Prinz, of Altona; (4) "First Aid to the Injured, more especially in Relation to Accidents occurring at Fires," by Dr. Leu, Army Surgeon, of Berlin; (5) "Hydrants," by Fire-brigade Inspector Bahrdt, of Berlin; (6) "Description of the Installation of Fire Alarms in a Street in Amsterdam, by which each House can give an Alarm to the Fire Brigade," by Fire Brigade Director Meier, of Amsterdam; (7) "New Forms of Fire-alarm Apparatus," by Herr Grebel, of Berlin.

On the social side were visits to the establishment of Messrs. Wertheim, the Whiteleys of Berlin, and to the factory of the Berlin Electrical Company, whilst in the evening a reception, attended by some 800 members of the Congress, was given by the Mayor and Corporation of Berlin in the Town Hall.

On Monday, the 10th inst., pleasure alone was the object of the Congress in the form of a steamboat excursion and a visit to the cable factory of the General Electrical Company.

From the nature of the papers read and the fact that some 2,000 members attended the Congress from all parts of Germany, from Austria, France, Russia, Italy, Denmark, Holland, Belgium, and the United States, it can be seen that the occasion was one of considerable importance as well as usefulness, in which England was represented by officers of the London Fire Brigade and Salvage Corps, the fire brigades of Manchester, Liverpool, and Birmingham, and several members of the National Fire Brigades Union and of the executive of the British Fire Prevention Committee.

COAL SMOKE ABATEMENT.—We are informed that the Coal Smoke Abatement Society are about to make a series of tests upon domestic grates, with the object of ascertaining the following facts:—1. The amount of fuel consumed when burning under ordinary conditions. 2. The amount of smoke emitted. For the present the lists will be limited to open sitting-room grates burning either bituminous coal or coke. The society invite manufacturers and patentees to submit a grate for this purpose. The only condition imposed is that the grate should be fixed and taken away by them at their own cost. The tests will be made in the Westminster district. Application to be made to Mr. E. Jackson, Secretary of the Coal Smoke Abatement Society, 59, Chancery-lane.


Silchester – Hampshire
Some of the objects of interest found during the past year.
Part of Mosaic pavement found in House No 1 Insula xxiii
Panel from Mosaic pavement found in House No 2 Insula xxiii
An enamelled brooch
A lamp
A key handle (bronze)
Scale for pavements
2 feet

SILCHESTER.

AMONG the many objects of interest found in the excavations at Silchester during the past year a small proportion only are of strictly architectural character. Apart from the houses themselves, the planning of which is always interesting, some pavements have been discovered in the houses Nos. 1 and 2 in Insula No. xxiii, near the north gate. The most ornate was found in house No. 2, and consisted of four panels surrounded by an ornamental border. Of these panels one is destroyed, two have a conventional pattern, and the fourth has a dolphin. The groundwork of the pavement was of chalk tesseræ, the dolphin and border being in grey tesseræ, with a few red fragments introduced into the fins, head, and tail. Of considerable interest is a plainer pavement found in house No. 1, an example of *opus sectile* and *opus tessellatum*. A small piece of the original is exhibited in a frame, and here illustrated. The squares and octagonal pieces are of brick, the intermediate spaces being filled with chalk tesseræ. These pavements have all been carefully drawn to scale by Mr. G. Fox, and his beautiful measured and coloured drawings are hung on the walls. A great deal of pottery was found, many of the objects being in a very perfect state; and in one of the numerous pits was a horde of iron tools, including smiths' tools, a scaber, or buttrice (an instrument used by farriers), a shoemaker's anvil, carpenters' tools, armourers' scythe anvils, and a remarkable fragment of a ladder. There are likewise many padlocks, chains, and handles, a bronze steelyard weight in the form of a bust, a bronze key handle, several examples of brooches (one or two enamelled) and other personal ornaments, fragments of glass, a lamp, and many pieces of painted plaster from the walls of the houses.

Other details will be found in the *Builder* for June 1, p. 544.

The exhibition closes to-day.

MAGAZINES AND REVIEWS.

THE *Art Journal* is almost entirely occupied with reviews and illustrations of the Academy, the New Gallery, and the Glasgow Exhibition. The article on the Academy is more remarkable for verbiage than critical insight, as may be gathered from the mere fact that the writer omits all mention of Mr. Wyllie's sea picture of the Bay of Biscay, perhaps the most powerful work of the year.

The *Magazine of Art* is also largely occupied with reviews of contemporary exhibitions; but it includes an interesting article on "Artists' Studios—as they were and as they are," though this article is apparently entirely occupied with studios "as they were," illustrated by representations of studios by the artists themselves; some of them perhaps realistic, some obviously imaginative. Possibly the subject is to be continued for the consideration of studios "as they are," though there is no intimation of this. An article on the "New Salon of 1901," by M. Henri Frantz, is an absurdly optimistic estimate of a very weak exhibition.

The *Studio* contains two articles of considerable interest on two special forms of artistic work: "The Medallist's Art," by Mr. Roger Marx, and "The Art of True Enamelling upon Metals" by Mr. Alexander Fisher; the latter partly practical, partly philosophical; the philosophic element is indeed rather too predominant, and includes a good deal of rhapsodising which is of no particular value. However, the article is to be continued, and will perhaps take a more practical turn in the sequel.

In the *Architectural Record* Mr. Montgomery Schuyler, writing under the heading "Nouveautés de Paris," draws attention to some recently erected Paris house fronts which go out of the usual very conventional line of Paris street mansion architecture. Yet, while we certainly agree that the average street architecture of the better streets in Paris is far too much conceived on one model, the one or two examples of this conventional Paris style which are given in the article are superior in architectural dignity and in the quality of style to the exceptional examples which are illustrated. One or two public buildings of Paris are included in the survey, and the author, we are glad to see, does full justice to the Musée Galliera, which he rightly estimates as "one of the most beautiful things in Paris." The illustrations of "Some Recent American Designs" are occupied with two buildings, a millionaire's residence designed by Messrs. McKim, Mead, & White, and the New York Yacht Club, designed by Messrs. Warren & Wetmore. The illustrations of the mansion are all interiors, which owe their effect as much to the general treatment of furniture and embellishments (which may however be the architects' work) as to architectural design in the stricter sense; the exterior is not illustrated. In the Yacht Club House the exterior façade is exceedingly French in type, except in the curious and most unsatisfactory treatment of the loggia story at the top, with apparently an open timber joisting as its only cover, the ends of the joists projecting over like so many spikes; the appearance of this, at the top of a very substantial stone elevation, is most absurd, unless indeed it represents something which is unfinished, in which case the photograph should have been deferred till the building was completed. The interiors show a bold variety of treatment; the "model-room" has a most "robustious" marble fireplace, also exceedingly French in design; the grill-room is designed in imitation of the "between decks" of a ship—a little architectural joke which however seems out of keeping with the remainder of the interiors. "Recent Domestic Architecture" is chiefly occupied with the illustration of another very costly mansion, very dignified and satisfactory in exterior design; in this case plans are given, which are of some interest as showing the arrangement of the principal or reception floor in a first-class American mansion. What is called the breakfast-room is a very large bay opening out of the dining-room, and apparently (from the dotted lines) capable of being curtained off from or thrown into the main room, at pleasure; there is something in this suggestion. The aspect compass of the plan is not given. Signor Melani contributes an article (translated) on "Modern Italian Architecture," a subject on which no Italian architect can be trusted to write, as his view of the subject is sure to be so merely local, national, and partial. The structures illustrated, and named with praise, include Signor Antonelli's "Mole" at Turin, an illustration of which was sent to us some time since, which we refused, not thinking it worth while to publish so hideous a monstrosity. The Ponte Nuovo at Pisa is a pleasing and well-proportioned bridge structure, and the modern synagogue at Florence has the merit of architectural unity of conception.

The illustrations of the *Berliner Architekturwelt* are still extensively occupied with the recent competition designs for the Charlottenburg bridge, which show some very fine and bold conceptions; it is in designs of this class that the architectural genius of modern Germany shows at its best. A children's hospital (Kinderasyl) in the Kürassier-Strasse at Berlin, by Herr Hoffmann, is a very pleasing building, both in general character and in many of the details.

In the *Artist* there is published a plan, by a "correspondent" whose name is not given, for a site for the proposed monument to Queen Victoria, in the centre of a proposed double crescent laid out to east and west of the new Holborn to Strand street, the memorial to be placed in the axis of the street. We do not think the idea has anything to recommend it. The neighbourhood is not the right one for such a memorial, and it would form a serious cause of delay that all the traffic should have to circulate round the great curve proposed, instead of taking the shortest route.

Feilden's Magazine continues Mr. Maxwell's useful and fully illustrated essay on "The Town Refuse Problem"; and there is also a valuable article by Mr. Archibald Little on "The Automatic Transmission of Material."

The *Engineering Magazine* contains Mr. Phillips's second article on "Competition in Iron and Steel Making," the main point of which is to consider how England is to hold her own against American enterprise and competition in this department of industry. And the conclusion is that if the men and their unions, will not co-operate with the employers in working with the best and newest labour-saving methods, successful competition is impossible. The same number contains an interesting article on personal recollections of Ericsson.

In the *Nineteenth Century* Mr. H. Hamilton Fyfe writes a short article on "Mr. Sargent at the Royal Academy." He commences by assuming that every one is wearied and depressed by a visit to the Academy exhibition, a position which we deny, and which is a mere piece of cant of the day; it is the fashion to sneer at the Academy, but for those who can find no interest at all in the annual Academy exhibitions we should say that the fault lies in themselves. The further argument is that the reason for this lack of interest lies in the fact that the painters have nothing original or striking to give us; that this is only not true in regard to Mr. Sargent; but that his failure lies in the fact that, though original he is not beautiful; in which there is truth. Burne-Jones's fame, as Mr. Fyfe says, lay in the fact that he had a clear ideal of what constituted beauty in art, and pursued it without swerving; and the one thing needed, he thinks, in Mr. Sargent's art is this quality of the ideal—"of imagination striving towards the noble and the beautiful, shrinking from the common-place and from all that is not lovely and of good report." He regards Mr. Sargent's sculpture in this year's Academy as an exception, and we agree with him in so far as that this work shows a distinct endeavour after beauty of design; but when he says that "the ideas which this fine work conveys are of the first order," we must again take exception. The idea of the work seems to us to be that of a repellent and painful superstition, but it is a fine work in a decorative sense. In regard to Mr. Sargent's pictures, however, we think he has hit the truth. They are remarkable for immense power of execution, without the sentiment of the beautiful; and it is as well that this should be recognised.

The *Pall Mall Magazine* contains an article by Mr. F. Wedmore on the French painter Chardin, which is a piece of fine and superior criticism. He contrasts Chardin with William Hunt, whose imitations of facts in Nature are

so clever, yet they are "never nobly seen." "Clever man as Hunt was, when you have tasted Chardin's art the savour of the art of William Hunt has gone out for ever." This may be a little too strongly put, but there is no doubt that too much has been made of Hunt's realism, which rarely if ever went beyond realism.

Scribner, in "The Field of Art," gives a criticism of the buildings and sculpture of the Buffalo Exhibition, but in default of illustrations one cannot gather anything special from it, except that we note that it had been determined that, in view of the picturesque quality of the park in which the exhibition was situated, the exhibition buildings themselves should be laid out on strictly symmetrical lines as a contrast; which seems a right view to take.

In the *Century* "Cole's Engravings of Old Masters" is represented by an engraving from Wilkie's "Boys Digging for Rats"; the light and shade effect of the picture is admirably translated in Mr. Cole's broad woodcut style, and it is surprising how well he has got the character and expression of the faces, on so small a scale, without departing from the prevalent texture of execution of the whole engraving. "The Centre of the World of Steel" (or what an American magazine calls the "center") is an interesting illustrated article by Mr. Waldon Fawcett on the work at the Pittsburg foundries.

We have received also *Harper*, the *Revue Générale*, the *Gentleman's Magazine*, and *Knowledge*.

THE SETTING OF PORTLAND CEMENT.*

BY GAVIN J. BURNS, B.SC., F.S.I.

PORTLAND cement, as commonly manufactured, consists of a fine powder composed of grains of irregular shape, varying in size from $\frac{1}{10000}$th to $\frac{1}{250}$th of an inch, and averaging about $\frac{1}{7000}$th of an inch. The grains are mostly transparent and crystalline in structure. A few opaque grains are interspersed among the others.

The specific gravity of the grains is 2·7. A bushel measure of cement weighs about 112 lbs. when loosely filled. This is equivalent to a specific gravity of 1·4. Consequently, in a bushel of cement about one-half the bulk is cement and one-half interstices. The weight of a bushel of cement, however, is of no scientific value, because the apparent heaviness of the cement depends on the capacity of the measure. A small measure filled with cement is only a trifle heavier than the same measure filled with water. When mixed with water and allowed to set, the powder absorbs 30 per cent. of water and yields a pat having a specific gravity when wet of 1·92 to 2·01. Briquettes made for testing, which have been allowed to soak for a week in water after being made, have a specific gravity of 1·95 to 2·15 when dry. A high specific gravity generally denotes a high tensile strength, as the following examples show :—

Specific Gravity.	Breaking Strength in lbs. per sq. inch.
2·04	295
2·05	325
2·05	440
2·08	460
2·10	550

The above specific gravities refer to the samples when dry. If they were saturated with water the figures would be 4 or 5 per cent higher.

In ascertaining the specific gravity of an absorbent substance like a briquette of Portland cement allowance has to be made for the absorption of water during the process. This can be easily done in the following manner :—Weigh the specimen in air; call weight in air *a*. Weigh again in water; call weight in water *b*. Take the specimen out of water immediately, and weigh while still wet a second time in air; call this weight *c*. Then specific gravity equals $a/(c-b)$.

It appears from the foregoing figures that if a bushel of cement weighs 112 lbs., it shrinks about 10 per cent. in bulk when set.

Part of the water used in mixing is simply held mechanically in the pores of the cement. This water evaporates on drying in a warm place. The remainder of the water enters into chemical combination with the cement in the form of a hydrate. The amount of water in chemical combination varies with the time the cement has been mixed. If a sample of cement is mixed and allowed to dry at once, the amount of water chemically retained is about 7 per cent. After the sample has been kept under water a week, the proportion increases to 17 per cent. The chemically-combined water is driven off at a dull red heat. Decomposition begins, however, at a lower temperature. This is shown by the fact that a briquette loses its strength when heated. Some sample briquettes which had been heated for four hours to a temperature estimated at 500 deg. were found to have been reduced to one-half their original strength.

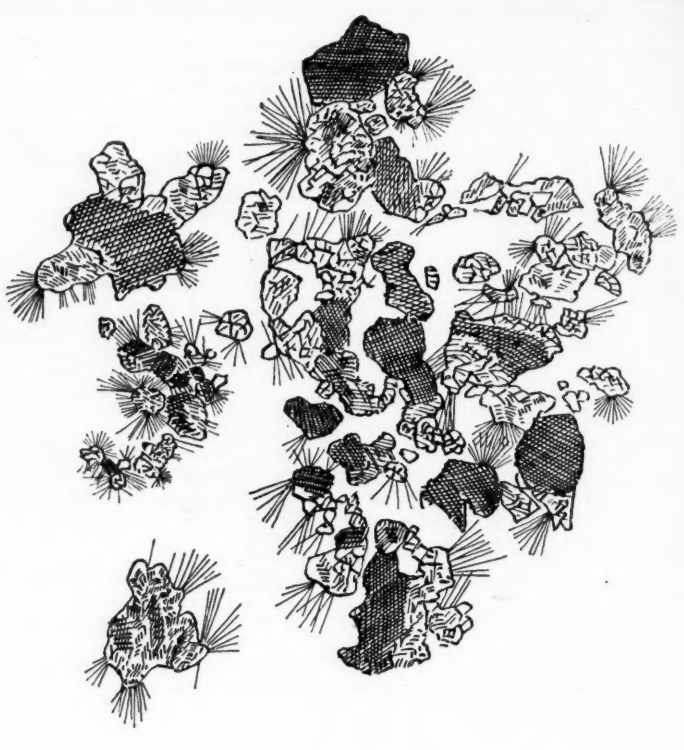
So far as I am aware, the process whereby cement, on setting, is converted into a solid mass has never been fully investigated. The cement itself is known to be a compound of silica, alumina, and lime, or a mixture of several compounds of these substances. It is also known that setting consists essentially in the formation of a hydrate. But it is not known precisely why the formation of a hydrate should cause the cement to set. Quicklime combines with water and forms a hydrate, but does not set; and there are many other substances which form hydrates, but do not show the phenomena of "setting." Why, then, should the combination of cement with water convert it into a substance harder and more durable than many kinds of stone?

Such being the case, I have tried to ascertain what information on the subject could be obtained by means of the microscope. A thin slice cut from a briquette of cement is easily seen to be a kind of conglomerate composed of opaque particles intermingled with transparent doubly-refracting crystals. In order to watch the process of setting a little cement may be dusted on a slide, an ordinary cover glass placed over it and fastened down, and the whole put into a dish of water. On examining the slide with a power of about 200 from time to time, it will be found that the grains of cement become covered with tufts of acicular crystals, which begin to make their appearance some times in half an hour, sometimes not for two days. The crystals are much too minute for their form to be observed, but they appear to be of uniform width, so may be assumed to be prismatic. The crystals appear to grow only in length, the width remaining constant. The greatest length I have observed is $\frac{1}{500}$th of an inch. The width was too small a quantity to be measured with the powers I have used, but is probably under $\frac{1}{10000}$th of an inch. The tufts of crystals generally spring from angles or prominences on the grains of cement. The crystals, in fact, somewhat resemble tufts of grass growing on rough ground. One can readily understand how the growth of these crystals on adjoining grains of cement, by interlacing with one another, unites the whole into a solid mass.

Let us consider a little more closely the manner of formation of these crystals. It may be safely assumed that they are produced by the combination of water with some constituent of the cement, and it is probable that this constituent is the active ingredient which causes the cement to set. Moreover, the definite form of the crystals implies that they have a definite chemical composition. It is also clear that the crystals are deposited from their solution in water, but that when once deposited they cannot be again dissolved. It appears, consequently, that Portland cement (or, rather, some one of its constituents) exists in two forms, one of which is soluable in water and the other an insoluble hydrate. In my opinion, it is to this fact that cement owes its power of setting.

In conclusion I may observe, as a matter of practical importance in the testing of cement, that the setting is greatly retarded by a low temperature. A briquette which has been kept in water only a few degrees above the freezing point will only stand about three-fourths of the stress which another briquette will stand which has been kept for the same time in water at 60 deg.

The accompanying sketch shows the appearance presented by Portland cement while setting, as seen under the microscope.



Microscopic View of Portland Cement in Course of Setting.

* This is reprinted from the "Professional Notes" of the Surveyors' Institution; but the diagram showing the microscopic appearance of Portland cement in setting has been specially made by the author for this publication.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A special meeting of this Association was held in the Royal Institution on the 5th inst., Mr. Henry F. Kerr, the President, in the chair. The Chairman referred in fitting terms to the death of Mr. John M. Brydon, London, and it was resolved that an expression of the Association's regret and sympathy be sent to the relatives of the deceased. Votes of thanks were awarded to all who had contributed directly to the success of the recent visitations, Mr. J. G. Goodchild, of the Geolo ical Survey, being specially mentioned in connexion with the "geological ramble" in the Queen's Park. Professor Baldwin Brown addressed the meeting on Durham, Hexham, and Chesters, with the view of conveying a general idea of the character and aspect of the principal buildings,

&c., to be visited on the occasion of the Association's annual excursion on the 14th and 15th inst. His remarks were illustrated by lantern transparencies.

ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—A special meeting of the Council of the Royal Institute of the Architects of Ireland was held at the Institute Rooms, 20, Lincoln-place, on the 5th inst., Sir Thomas Drew, the President, in the chair. The following resolution was passed unanimously :—"The attention of the Council of the Royal Institute of the Architects of Ireland has been directed to recurring instances in which county surveyors, under the new establishment of county councils, are engaging in private practice, both in architectural and engineering work. This Council are of opinion that in the interests of the public service it is desirable that the county councils should avail themselves of the powers conferred upon them by Section 115, Sub-Section 18, of the Local Government (Ireland) Act, 1898, for the purpose of making such arrangements with the county surveyors as will enable them to devote the whole of their time to their official duties."

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting, Wednesday, June 5, Sir Henry H. Howorth, President, in the chair, Professor W. Boyd Dawkins gave an account of the exploration of the cairn at Gop, near Prestatyn, on the east side of the Vale of Clwyd, and of the cave discovered close by. The cairn, called in local talk the tomb of Queen Boadicea, consisted of a pile of blocks of limestone 330 ft. long, 223 ft. wide, and 46 ft. high. A shaft was sunk in the centre to the level of the solid rock, and from this three drift ways were carried along the line of the rock to a distance of 30 ft. with but negative results, the only remains met with being a few bones of sheep or goat, hog, and ox or horse of the usual prehistoric refuse-heap type. The stones were too loose to allow the exploration to be carried on further without timbering, and it was found impossible satisfactorily to explore the heap without removing the whole of the stones. The cairn probably marks the position of the sepulchral cave which was discovered below at a distance of 141 ft. The site of this cave was marked by a fox earth, which completely covered the entrance. On cutting into it, the broad opening of the cave was revealed, filled with three distinct deposits. On the rocky floor of the interior of the cave was a stiff yellow clay, from one to two feet thick, belonging to the glacial period, and without any fossil remains. Above this was a layer of grey clay—2 ft.—containing the remains of the cave hyæna, bison, stag, reindeer, roedeer, horse, and woolly rhinoceros. Above this, extruding to the roof of the cavern, was a prehistoric accumulation about 6 ft. thick, containing bones of the domestic animals used for food by man, proved by the associated pottery to belong to the Bronze Age. It was largely a refuse heap accumulated during the time it was occupied by man. As this was worked away towards the inside a large number of bones were met with underneath slabs of stone, and when these were removed a wall became visible, built of rubble stone, about 4 ft. high and 4 ft. long. This proved to be one of three walls of a sepulchral chamber, the fourth being formed by the inner wall of the cave. Inside were the remains of upwards of thirteen skeletons of various ages, which had been buried in successive times in a contracted posture. Associated with them were fragments of pottery of the Bronze Age, two links of jet or kimmeridge coal, and a carefully ground flint flake, looking almost like the blade of an ivory paper knife. The examination of the skulls proved that the predominant type was that of the long oval-headed inhabitants of the district in the Neolithic Age, while two were round heads belonging to the later Goidelic conquerors of Britain in the Bronze Age. One of these was a female skull. This association of the two races in one family vault affords clear proof that at this time the fusion of peoples had begun, which has been going on ever since, a fusion in the course of which the Iberic tongue gradually became obliterated. In later times the arrival of the Brythonic peoples caused in its turn Gaelic to yield place to the Welsh tongue, and to be represented mainly by isolated names of places and rivers. Professor Dawkins thought it very probable that the cairn was made to mark the site of the family sepulchre.—Mr. E. W. Brabrook read a paper on "Mediæval Lavatories," illustrating his subject with a drawing of the twelfth century example at Christ Church, Canterbury. He gave a list of remaining examples, chiefly monastic, divided into two classes—those with circular or octagonal plan, and those with rectangular plan. Of these the first class contained all the earlier examples. Referring to the lavatories at Canterbury and at Mellifont, visited in 1900 by the Institute, he noted the persistency of the opinion held by a former generation of antiquaries, that these buildings were baptistries ; at Canterbury the authorities went so far as to place a font in the upper chamber there, by way of restoring the building to its original use. The description of the great lavatory at Durham, from the "Rites of Durham," gave an excellent idea of the magnificence of these structures in the larger monastic houses. Of the second class with rectangular plan, a very fine specimen existed at Gloucester in the north wall of the cloister, complete except for the lead linings of the water-trough. This form was the usual one for domestic lavatories, which were sometimes very large, as in the case of one of which it is recorded that a hundred knights and ladies could wash there at the same time.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The concluding meeting of the session was held on the 5th inst., Mr. Blashill, Vice-President, presiding. Mr. E. W. Fry, of Dover, sent photographs of the Romano-British pottery recently discovered at Walmer and a plan of the site, with some interesting notes. Among the exhibits were two antique candlesticks of iron of peculiar construction, probably of Dutch origin, shown by Dr. Winstone, who also exhibited some leaf-shaped and some barbed arrow-heads with modern mounts. Dr. W. de Gray Birch read a paper on "Some Aspects of the Life and Times of King Alfred the Great," in which he pointed out that the celebration of the millenary of Alfred would have been one of the more prominent events of the year had it not been for other imperial causes which had acted adversely in this respect. As it was, however, London by a special exhibition in the British Museum, and Winchester by a special congress, were preparing to honour Alfred's name and fame, and thus the two cities with which Alfred was very closely connected would be doing something to remind us of his time. Dr. Birch recapitulated, at some length and in well-chosen words, the familiar story of the King's life, his youthful years, his afflictions, his predilections, his wars, and his occupations, brushing away, as he did so, many apocryphal stories that have grown up round the hero, and devoted considerable time to a critical exposition of the archæology of the "Alfred Jewel" and other cognate relics of the Anglo-Saxon goldsmiths' and enamellers' arts, and to a description of the numerous literary works on which Alfred occupied himself.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—A visit was made by the members and associates of this Society on the 12th inst. to the air-compressing station for the Shone system of sewage ejection at the Sewage disposal works, Erith, Kent, and the engineering works of Messrs. Fraser & Chalmers, which are also situate at Erith. The party first visited the air-compressing station of the Erith sewage disposal works, where there are four gas-engine air-compressors, two sets in duplicate. All four engines have automatic arrangements for throwing the air-cylinders out of work when the working pressure in the receiver is reached. The Shone ejector system has been fully described in our columns on former occasions. The party subsequently visited the works of Messrs. Fraser & Chalmers, which have been in operation for about ten years, and are well equipped with modern tools and appliances. The manufactures carried on are gold and silver mining machinery, hoisting and pumping engines. Riedler patent mechanically controlled valves are used for pumps and air compressors. In the machine and fitting-shop is a pit 80 ft. long by 20ft. wide and 8 ft. deep, covered with a removable floor, so that in erecting vertical engines there is a vertical height under the crane of 45 ft. The works are connected by rail with the South-Eastern railway, and cars can be loaded direct from the machine shop cranes.

THE INSTITUTION OF JUNIOR ENGINEERS.—On Saturday afternoon, June 8, a large party of the members were, by the courtesy of the engineers, Sir John Wolfe Barry and Mr. C. A. Brereton, enabled to inspect the Kew Bridge works. They were shown over by the resident engineer, Mr. R. W. Dana, and on behalf of the contractor by his son, Mr. Alexander Gibb. The work of reconstructing Kew Bridge consists of three distinct parts :—1. Construction of a temporary bridge ; 2. Removal of the old bridge ; 3. Construction of the new bridge. The temporary bridge was begun in March, 1899, and was opened for traffic on October 12 of the same year. It consists of an 18-ft. roadway, with two 5-ft. footways carried on timber trestles and piles, and is about 300 yards in length. For the river traffic three openings are provided, a central one of 75-ft., a northern one of 40-ft., and a southern one of 50-ft. clear span, the roadway being carried across these by trough flooring resting on plate girders, from which the footpaths are bracketed out. The roadway is wood paved throughout. The removal of the old seven-arched bridge was begun directly the temporary bridge had been thrown open to traffic. The parapets, roadway, and filling above the arches were first removed, then centres were successively placed under the arches and the latter were removed course by course. The old pier foundations, which have given some trouble to get out, are laid on timber platforms sunk from 3 ft. to 10 ft. below low water line. The old bridge is now all removed, with the exception of the foundations of the two central piers and a portion of the approach viaduct and piers. The new bridge consists of three elliptical spans, a central one of 133 ft. and two side spans of 116 ft. 6 in. each, with a central headway of 20 ft. above T.H.W. The width between parapets is 55 ft., or more than double that of the old bridge, and the gradient of the approaches is 1 in 40. The arches are of granite throughout, and in the piers and abutments the granite is backed with brindle brickwork in cement. Over the piers there are to be four shields, carved in granite, bearing the arms of Middlesex and Surrey respectively. The outline of the voussoirs is brought into relief by heavy rock facing with rusticated joints. Both pier and abutment foundations were put in by means of whole timber (single row) sheet piling cofferdams, tongued and grooved, and driven 5 ft. below the finished foundation level, which for the piers is 16 ft. below the bed of the river or 14 ft. into the London clay. A month ago the north abutment had been built up to springing level, and three courses of arching had been laid before the centering ribs, which are to carry the arching during construction, are erected. The north pier is built up to springing level ; the south pier foundation is excavated, and the concrete is being put in ; and the south abutment cofferdam is being driven preparatory to excavating. The granite is obtained from Cornwall and Scotland, that from the latter being exclusively used for the parapets and finer work. The bridge is expected to be completed in the course of next year (1902). The contractor is Mr. Easton Gibb, of Aberdeen.

ARCHITECTURE AT THE ROYAL ACADEMY.—By a mistake, in our last issue we attributed the design for the memorial to the Duke of Westminster (No. 1,552 in the Royal Academy) to Mr. A. C. Blomfield ; it is by his brother, Mr. C. J. Blomfield.

CATHOLIC CHURCH, NEWTOWN, HUNTINGDON.—A Catholic church, to be known as St. Michael's, has been erected at Newtown, Huntingdon. It is from designs by Mr. S. Croote, of Brampton, the building work being in the hands of Mr. M. Allen of the same village. The stone carving has been accomplished by Mr. Baxter. The building is in the Romanesque style. The main entrance is facing the road, by way of a porch. In plan the building is cruciform, the sanctuary being apsidal, the arms of the cross being formed by the Lady chapel and a small sacristy. By a convenient extension the latter can be entered under cover from the priest's residence. Adjoining the sacristy is the confessional. The small gallery over the porch provides accommodation for the organ and choir. Ancaster stone is used in the interior of the building, and the quoins and dressings outside are of Weldon stone, while the structure is covered with Broseley tiles. The aisle, sanctuary and Lady chapel are paved with encaustic tiles, but under the seats the flooring is of wood. The steps to the sanctuary are of the hard grey York stone. A low-pressure hot-water apparatus warms the building.

TRADE CATALOGUES.

THE Simplex Steel Conduit Company, Limited, of Coventry-street, Birmingham, have sent us an illustrated price-list of their steel conduits and fittings for installing the electric light in buildings. The conduit system of wiring has many points in its favour, and is being extensively adopted all over the country. We notice that there has been a reduction in the prices of the smaller sizes of fittings, and many improved forms of accessories are described. They have also sent us a small book on "Conduit Wiring and Erection," by Mr. Waterhouse, which contains a clear description of the method of installing the 'Simplex" system of steel conduits. This book is a thoroughly practical one, containing many valuable hints on points connected with electric wiring which it would be difficult to find described elsewhere. We would mention specially the diagrams given for "looping in" and "looping back," and the description of the methods of getting the conduits round obstructions like cornices, ⊥ iron girders or beams.

The General Electric Company, of Queen Victoria-street, have sent us their illustrated catalogue of electric fire-alarms. They seem to have worked out a very efficient system of fire-brigade calls, which can be seen in operation at Walthamstow and Tottenham. The alarm-pull is so constructed that when it is pulled out the handle is locked, and a bell rings, showing that the signal has been received at the station. This is also a great assistance in the detection of false alarms. When the signal is received at the station the attendant puts the plug in the hole underneath the fallen shutter on the switchboard, and listens to the telephone. If it is a real alarm he will hear the bell ringing in the post, but if it is merely a short circuit of the wires no sound will be heard, and hence the brigade will not be called out unnecessarily. In addition, the General Electric Company provide a most ingenious pocket telephone containing a combined transmitter and receiver with a telescopic action, which can be readily attached to the fire-alarm pillar, so that communication can be made by a fireman with headquarters directly, and further help summoned or countermanded. This pocket telephone will also be of the greatest use to inspectors, who will be able to make periodic rounds and test all the street posts without any risk of calling out the brigade. ——We have also received from the General Electric Company a catalogue describing their "Geeko" telephones. We think that this telephone will prove a great boon to householders. The use of telephones for private inter-communication is far too much neglected in this country. Probably this is due to the mistaken notion that the National Telephone Company hold a monopoly for the erection of telephones. The telephones illustrated in this catalogue are low-priced, and the cheap bell-push telephone which can be added to any system of electric bells ought to popularise telephony for household purposes. Both on the Continent and in America private telephones are used, we might almost say universally, and it seems a pity that such a great convenience should not be more widely used in this country. ——They have also sent us their catalogue of "Freezor" electric fans and small-power motors for continuous and alternating currents. The desk and table fans only take the same current as an 8 c.-p. lamp, and by a simple regulating switch they can be made to run at three different speeds. The small bracket-fans, being provided with lugs for screwing on the wall, can easily be placed in the most advantageous places for dealing with vitiated air. The "Freezor" slow-speed ceiling-fans are very similar to a type of fan that is very extensively used in America. In India, where electric power is available, ceiling-fans have entirely superseded hand-driven punkahs. From a sanitary point of view there is no doubt that they are very desirable. "The Edison" electric-motor fan is a small cheap combined fan and motor, which works very well with a primary battery. The catalogue also contains descriptions of electric blowers for smiths' fires, brazing forges, forcing the draught of boilers, and for ship and mine use. The motors can be made for either direct or alternating current supply, but to obtain a slow speed with alternating currents of high frequency is more difficult than with direct currents, and the motors are therefore more costly.

Messrs. Mather & Platt, Limited, of Salford Ironworks, Manchester, send us a copy of the fourth edition of their "Pocket Catalogue and Tables of Useful Information." Part I. of this little book is devoted chiefly to the description and illustration of electrical machines, and there is a good deal of information in tabular form which ought to be of service to architects and engineers. Part II. contains a selection of tables and notes of the kind to be found in most engineering note-books. Some of the matter is clearly original, and the whole of this part appears to be thoroughly up to date. Many of the tables naturally bear upon electrical engineering, but others, especially those relative to the economisation of steam and power transmission, are of general interest.

Messrs. Easton & Co., Limited, of Erith and London, send us a pamphlet descriptive of the "Schmidt system of utilising highly superheated steam." It has been recognised for many years by engineers that the condensation of steam in various parts of an engine must necessarily occasion considerable loss, and the attempt was made long ago to reduce such condensation by the use of superheated steam. Serious difficulties were encountered in connexion with early applications of high superheating, occurring partly in the superheater and partly in the engine. In the case of the superheater it was found that the tubes were apt to be burnt out rapidly, and in the case of the engine trouble was experienced owing to the construction being unsuitable for high temperatures, and to the difficulty of procuring lubricants capable of withstanding the degree of heat involved. In Mr. Schmidt's system of superheating the difficulties in question have been successfully overcome, and owing to the production of mineral lubricants with a very high flash-point, no difficulty is now experienced in maintaining efficient lubrication. As a matter of fact, some hundreds of engines are in operation on the Schmidt system with steam at the high temperature of 600 deg. Fahr. in the cylinders, and without undue wear and tear of the working parts. A full account of the system is given in the book, to which we refer our readers for further particulars. In it will also be found some interesting records of investigations by Professor Ewing, F.R.S., of Cambridge University, and Professor Lewicki, of Dresden, and some reports by Mr. Bryan Donkin, of London. The Schmidt system has hitherto been chiefly employed on the Continent, but it is now to be exploited in the British Empire by the company that has acquired the works and business carried on for many years by Messrs. Easton, Anderson, & Goolden, at the Erith Ironworks, Kent.

The Steel Armoured Insulating Conduit and Accessories Company, of 63, Queen Victoria-street, have sent us their illustrated catalogue of conduits for electric wiring. They state that the cost of their system is only 5 per cent. more than that of the ordinary total expenditure for a complete electric installation. As shown from the full instructions given in this catalogue, the piping can be installed by any ordinary plumber who has the assistance of a wireman to indicate the size of the conduits required. Its erection is carried out in the same way as the pipes for gas and water; the best time for putting them in is before any plastering has been done. The wires and porcelain connexion fittings are put in when the main building operations are completed, but before the final decorations are finished. For high-class wiring we think that this system is very desirable.

Husson's Safety Acetylene Syndicate sends us a catalogue of generators, purifiers, and fittings for acetylene lighting installations. The generator made by this syndicate is one of the non-automatic description, and is used in connexion with a gasholder large enough to contain all the gas made from a charge of carbide. Non-automatic generators are, in our opinion, decidedly preferable to the automatic class, although the comparatively large gasholder required for the former adds considerably to the initial cost of the installation. The gasholder should always be of sufficient capacity to contain more gas than will be consumed during any one evening. The prices for large gasholders vary from 130*l.* for one of 500 cubic feet capacity to 310*l.* for one of 2,000 cubic feet capacity. The price quoted for carbide is 23s. to 27s. per cwt. A list of prices is given for installations of various sizes, the price of a generator, gasholder, and purifier to supply for eight hours twenty 12-candle power flames, each consuming ¼ cubic foot of gas per hour, being 35*l.* The prices quoted for the installations do not include prices for the pipe connexions between the generator, purifier, and gasholder.

Messrs. Homan & Rodgers, of Gracechurch-street, London, send us a copy of "Standards and Tables of Constructional Steelwork," compiled by Ernest Homan and Leopold Mensch. This work, in pocket-book form, is an excellent production, giving sections of and particulars relative to girders, joists, stanchions, and columns, as well as full information as to the bases adopted for all the calculations involved. We are pleased to observe that due prominence is given to the important questions of deflection in girders, and the effects of eccentric loading in connexion with stanchions and columns. The book is one of the few similar works published in this country which contain such details as every architect ought to possess relative to constructional steel.

Mr. William Key sends us a pamphlet containing a description and recommendation of his system of mechanical ventilation on the Plenum principle. While we agree with much that he says, and especially as to the inefficacy of what is called "natural ventilation," he does not benefit his case by decrying every other system. There are cases in which extract ventilation is better than plenum. It is absurd, also, to try to persuade people that mechanical ventilation is cheaper than any other.

Mr. W. Duncan Tucker sends us an illustrated catalogue of his horticultural buildings, conservatories, winter gardens, ferneries, &c. The illustrations for the most part represent buildings actually erected. The catalogue includes also plant frames, boilers, and hot-water pipes and connexions.

Mr. E. G. Herbert, Cornbrook Park Works, Manchester, sends a sheet containing description and illustrations of his "Eccentric Sawing Machine," "Girder Saw," and "Vertical Sawing Machine." In all these a special principle is acted on, to the effect that "few teeth in action make fast cutting," because in cutting a wide section the weight of the saw is distributed over so many teeth that they tend to slip over the work without cutting. This is, in fact, only common sense, though Mr. Herbert may be right in saying that it is often not acted on. In describing the "Eccentric" sawing machine he says:—

> "The guides of the saw frame are mounted on an eccentric on the main shaft, the eccentric being so geared as to make a portion of a revolution after every twenty strokes of the saw. The effect is to periodically change the inclination of the saw, causing it to constantly cut on a 'corner' instead of bearing on the whole width of the work. This greatly increases the cutting speed, and permits of the use of a thin fast cutting blade under a light weight, with consequent freedom from buckling."

Messrs. Craker & Dunmore (Harrow) send a leaflet describing their "Harrovian" water waste preventor. To render it intelligible they should have appended a larger and clearer diagram. The following is their own description of its working:—

> "The operation of the apparatus is as follows:—When the float is down the valve is open and water flows freely into the upper cistern, and when nearly full overflows by the pipe and charges the lower cistern to such a level that the float rises sufficiently to close the valve, whereupon the supply of water ceases.
>
> But after the valve is closed there remains temporarily in top cistern a quantity of water which passes through the after flush-hole arranged in pipe and descends into the lower cistern, filling it to a higher level, therefore giving the float greater buoyant force, so that it keeps the valve closed when the pressure in the service-pipe is considerably raised."

Messrs. E. & F. N. Spon send a catalogue of books published by them in connexion with architectural and building subjects.

Mr. C. D. Phillips sends us a catalogue of the productions of the Emlyn works at Newport (Mon.), including portable and semi-portable engines, and some specially designed mortar-mills, intended to resist the hard wear from efficiently grinding such materials as old bricks, clinkers, ashes, &c. There is also the Emlyn mortar mill, in which the mill is combined with engine and boiler, for economy of space and convenience in moving it from one situation to another. The catalogue also includes the "Acme" stone-breaker and brick-breaker, travelling cranes, crab-winches, &c.

Messrs. Moffatt & Eastmead, Limited, send us some sheets illustrative of their hydraulic

and electric lifts of different types. Attention is specially directed to the patent safety self-sustaining lifts of this firm, in which the hoisting machine is fitted with a self-sustaining shaft in place of the usual worm gear, and has an automatic mechanical stop action to prevent over-winding. Moffatt's feed-water heater for steam boilers forms the subject-matter of another sheet issued by the same firm.

The Otis Elevator Company send us a small pamphlet briefly describing the main features of the principal forms of their lifts. In addition to the usual safeguards against various forms of accident, the Otis Elevators are fitted with a speed-governor limiting the speed of the car to the velocity for which the governor has been set, and the action of this device is quite independent of the ropes. In case these should break, the governor would bring into action the safety apparatus attached to the lift cage. An Otis speciality is a very neat type of electric lift for private houses. This lift is operated by push-buttons at the landing doors and in the car. The car stops automatically at the landing corresponding with the button pressed, and the door cannot be opened until that landing has been reached, while the car cannot be removed until the door has again been closed.

Messrs. Pilkington Bros. (St. Helens) send us a pamphlet containing a description of their wired rolled glass, which has before been referred to in our columns, and a description of the result of a test of its fire-resisting qualities, apparently made at their own works. A reprint of a test by an independent authority would, however, have been more to the purpose.

Mr. John Jones (Chelsea) sends a new descriptive catalogue of his drain testing and cleaning appliances, to the excellent character of which we have borne testimony on former occasions. Among articles under the head of sewage-cleaning apparatus are some which we believe we have not before mentioned; the double sewage scraper, with a backward and forward action, for penetrating the collected sludge and then drawing it back; and the "crow's toe" or grappling hook, with a wheel for running along the invert of the sewer, and which is for use in searching for tools or in dragging sewers. Mr. Jones sends also a sheet of small illustrations of sanitary specialities.

Messrs. J. Sagar & Co. send a list (not illustrated) of their woodworking machinery. They are quite right in their suggestion that the lowest-priced machine is not necessarily the cheapest.

The British Uralite Company send a sheet of particulars as to the fireproof and non-conducting material which they have named Uralite, and which is composed of asbestos fibre and mineral substances only. We have already mentioned it with approval in connexion with the exhibit at the Building Trades' Exhibition.

Messrs. Joseph Sandell & Co. send us an illustrated catalogue of their doors, balusters, closet-fittings, &c., and full-size sections of skirtings, handrails, and other mouldings.

Messrs. Mason (Manchester) send a prospectus and illustration of their "Runwell" patent lavatory, which has a siphonic discharge instead of the usual waste and overflow, the action of which operates in cleansing the waste outlet and keeping it clear, and does away with the brass plug and washer, &c. When not in action the siphon bell forms a trap with a 2-in. seal.

The B. & S. Folding Gate Company send us an illustrated catalogue of the steel rolling doors, shutters, and partitions made by the Kinnear Manufacturing Company, of Columbus, Ohio (for whom we presume the Folding Gate Company are the British agents). The steel shutters seem to be made of a great size, one illustration showing a single shutter covering an opening 35 ft. 6 in. wide by 20 ft. high. An illustration is shown of the interior of the Art Institute at Chicago, the internal openings in which are fitted with Kinnear steel rolling doors, thus isolating any room at pleasure and without any difficulty. Attention is also drawn to the building on the Knox estate, at St. Louis, which is furnished with twenty-six Kinnear steel rolling shutters which close automatically in case of fire. Then there are external shutters shown in another illustration, which are always open except in case of fire, when they close automatically at 150 deg. of heat. But can they be depended on to act in this way after a long period of inaction? That is the important question. The catalogue includes directions for erecting the Kinnear doors and shutters. We are certainly disposed to believe in their high protective qualities, with the above reservation in regard to limit of endurance.

Mr. John P. White sends us an illustrated catalogue of garden furniture of the excellent and artistic quality for which his firm is now famous. This includes designs for trellis-work, dovecots, sundials, seats, &c., all designed in a good and sensible style, and illustrated in artistic drawings.

BOOKS RECEIVED.

EARLY DEFENSIVE EARTHWORKS.—By J. Chalkley Gould. (The Bedford Press.)

THE ART AND CRAFT OF GARDEN MAKING. By Thos. H. Mawson. Second edition, revised and enlarged. (B. T. Batsford.)

SOME ARCHITECTURAL WORKS OF INIGO JONES. By H. Inigo Triggs and Henry Tanner, jun. (B. T. Batsford.)

THE BENEDICTINE ABBEY OF SS. MARY, PETER, AND PAUL, PERSHORE. By Francis B. Andrews, A.R.I.B.A. (Midland Educational Company, Birmingham.)

Correspondence.

To the Editor of THE BUILDER.

GLASGOW ROYAL INFIRMARY COMPETITION.

SIR,—The enclosed cutting may, I think, find a place in your journal. Dr. Anderson's straightforward protest is a fine example to some of our weak-kneed assessors.

But it is only just to the committee to say that their action has been consistent, for from the first they have declined any obligation to accept their assessor's award. It was owing to their refusal to give any satisfactory undertaking on this point that I felt myself unable to accept their invitation to compete.

Is it not remarkable how business men (in this case gentlemen of the highest ability) who would never in the management of their own affairs slight the well-considered opinion of their trusted advisers, whether in medicine, law, or art, will yet as a committee take the grave responsibility of rejecting the expert advice themselves have sought?

Cheerfully dismissing doubt, they will attack problems requiring for their solution the nicest consideration by men who, with an ability not less than their own, have spent their lives in studying them. Yet, were conditions reversed, they would deem it folly to entrust the decision of technical matters affecting their manufactures or finance to the judgment of an amateur committee were its members never so brilliant.

I have the greatest admiration for the work of the distinguished architect selected by the Committee, and he has my heartiest congratulations on his success. Nevertheless, it is not for the ultimate good, or of himself, or of the brethren, that matters should have so fallen out. If the result of all the care and anxious thought bestowed by an assessor of Dr. Anderson's attainments and standing be naught, how hardly shall the younger man obtain respect? A new reading is given to the old appeal "Quis custodiet ipsos custodes!"

JOHN W. SIMPSON, F.R.I.B.A.

*** The following is Dr. Rowand Anderson's published protest, referred to in Mr. Simpson's letter. Dr. Anderson's letter appeared in a Glasgow daily paper:—

"ROYAL INFIRMARY RECONSTRUCTION.

SIR,—In consequence of absence from home, I have only now seen the statement formulated and published by the Executive Committee detailing and justifying the steps they have taken and the course pursued by them in dealing with the plans. As my name has been introduced into this statement, I beg you will allow me a few words of explanation.

The committee, in referring to me, say that my function, as I frankly acknowledge, was to 'guide and not to select.' Sir David Richmond stated publicly that I was engaged as 'Technical Adviser, not Assessor.' My appointment, as stated in the minutes, is in the following terms:—'The Sub-Committee thereupon agreed to appoint and hereby appoint Dr. Anderson as Assessor to the Committee.' In the printed terms and conditions of competition issued to architects it is stated that the Committee 'will appoint a neutral architect of standing as assessor, and will give the fullest consideration to his advice.'

The Committee then proceeded to say that one of the two plans which most nearly conformed to the sketch plans issued for the guidance of competitors was not included by me in the short leet, and 'that further interviews with me satisfied them that its exclusion arose from no failure on the part of the selected plans in regard to vital or essential particulars, but chiefly from a difference of opinion in regard to the style of architecture and the general elevation, matters on which the Executive Committee ventured to think they were quite entitled to follow their own opinion, and the minority cordially acquiesced in the selection of the majority.'

From the above statement it appears that the Executive Committee considered themselves quite competent to judge not only of the technicalities of the building as an infirmary, but also of its architecture; that being so, one naturally asks why they called in an Assessor.

In proof of their competency to judge and decide on all matters connected with the building, they state that 'the minority cordially acquiesced in the selection of the majority'—which majority consisted of one. This majority would have been converted into a minority but for most unfair canvassing of the committee before I gave my final explanation.

Had I known of this in time I would have thrown up my commission.

It is entirely wrong to lead the public to believe that it was solely on account of the architectural treatment of the design they selected that I did not include it in the short leet. I gave the most minute and searching examination to every plan submitted in the competition, and in arriving at a decision I attached supreme importance to those qualities which constituted, according to my view, a scientific building, and one adapted to its purpose, and I maintain that the one I placed first embodies a greater number of merits than any of the others.

'The committee believe that they have shown discretion in approving the architectural style of the adopted plan, and they say it is distinctly Scottish—the national art of the fifteenth and sixteenth centuries, of which we have examples in Heriot's Hospital, Holyrood, Linlithgow, and Falkland Palaces, and in our own old College lately in the High-street.' 'It is, therefore, not only appropriate to the historical associations of the site upon which stood the castellated Bishop's Palace, but permitting, as it does, a limited use of Gothic forms, as in Heriot's College, Edinburgh, it is more in harmony with the Cathedral itself than any classic or modern style.'

Ranker architectural nonsense than this was never penned, and whoever composed it is absolutely ignorant of the meaning of the terms he uses. I fail to see what associations there can or should be between a building dedicated solely to the relief of suffering humanity and one erected in a semi-barbarous age, and built with appliances for dealing death and suffering outside and cruelties and torture inside.

If the relief of the sick and the hurt is to be the one paramount object of this building, that can only be accomplished by utilising to the utmost the beneficent and curative forces of Nature and the teachings of science, and not by erecting and wasting money on the ghastly absurdity of a Baronial Infirmary.—I am, &c.,

R. ROWAND ANDERSON.

16, Rutland-square, Edinburgh, June 4."

BOARD SCHOOLS, KNOWLE, BRISTOL. — These buildings comprise the large mixed school, which provides accommodation for 500 children, and provision is also made for an extension of classroom accommodation for 100 additional children. The infants' school accommodates 250, with future extension for another 100, and a separate caretaker's house is provided. Owing to the sloping nature of the site a basement has been obtained under a portion of the mixed school, where is placed the technical instruction department, comprising a combined cookery school and laundry, bonnet-room, and model sitting-room and bedroom for the teaching of housewifery subjects. Divided from this portion by a playshed is a manual instruction workshop for the boys. The architect is Mr. H. Dare Bryan, of Bristol. The building has stone walls faced with red Cattybrook brick, with Bath stone dressings. The roofs are covered with red tiles, and the floors generally are of wood blocks on concrete. The playgrounds are asphalted and surrounded by a dwarf wall, with railings and gates of wrought iron. One of the chief features of the scheme is the central hall of the mixed school, 80 ft. by 35 ft. The general contractors were Messrs R. Wilkins & Sons. The buildings are warmed on the low-pressure hot-water system. The work has been done by Messrs. Crispin & Son. The sanitary arrangements are in separate buildings for the three departments, and the fittings have been executed by Mr. G F. Tuckey.

WESLEYAN CHURCH, ST. LEONARDS.—A new Wesleyan church is being erected in Norman-road, St. Leonards, to take the place of the church that was demolished by fire on Good Friday in last year. The building has been erected by Mr. W. G. Morgan, of St. Leonards, from plans by Mr. J. Weir, of London, and the total outlay will amount to about 5 500*l*.

Illustrations.

ILLUSTRATIONS OF SCULPTURE AT THE ROYAL ACADEMY.

ALL the examples of sculpture contained in the two plates we publish this week are from works exhibited at the Royal Academy, and all are referred to in the second article in the present issue. Mr. Schenck's "Summer" and "Autumn" are, however, treated as separate illustrations on a larger scale, because they are more especially architectural sculpture, intended for the decoration of a building, and therefore more closely related to the central subject of this journal.

A COUNTRY CHURCH.

THIS church is proposed to be built in the suburbs of a Yorkshire town. The plan is unique in form, the centre portion between the nave and chancel being a spacious low tower, with open timbered roof filled with tracery, above which is a flêche with stained glass windows, shedding a very subdued light amongst the traceried timbers. This flêche forms an extract for vitiated air in the winter, aided by eight fresh-air inlets distributed throughout the church.

On the south side a morning chapel is divided from the tower by an arcade and oak screen, and is to contain a large Jacobean monument of the family of the principal donor (who is Lord of the Manor) at the west end. Under the east window a small altar is to be placed.

Between the central tower and the chancel an oak rood screen will be placed, and the choir stalls and pulpit are of oak. The lectern is an old Jacobean desk restored, and is a gift, together with stained glass east window for the chancel. Some interesting remains (the property of the donor) of a thirteenth century window, are to be inserted in the chancel in the form of a sedilia.

The fresh air during the winter months will be admitted by way of the channels for the heating pipes, in such a manner as will not interfere with the action of the extract in tower roof.

A bell turret, containing one bell, will stand at the south-east corner of the tower. The south porch is of open tracery and open timber roof, the doors into the church being double, a pair hung on the outside of the wall and a pair inside, the single doors opening in the thickness of the wall. The north porch is enclosed.

The walls are proposed to be built of rough coursed rubble and Whitby dressings with occasional six-inch courses of red sandstone. The roofs to the tower and porches would be covered with oak shingles, and the main roofs with stone tiles.

The estimate for the church (excluding all the oak work and the reredos) amounts to 5,600*l.*, and there is accommodation for 480 worshippers. This price does not include the small altar and furniture in the chapel.

The drawing was hung in the Royal Academy Exhibition of 1898. E. B. LAMB.

ST. SIMON'S, SALTRAM-CRESCENT, W.

THIS design was selected in limited competition some time ago, but was not carried out. Below the church the whole of the space was arranged for parochial purposes; the site was irregular and unsuitable. The designs were prepared by Mr. William A. Pite.

PLAN OF THE WALL OF JERUSALEM.

THIS plan of the wall built around Jerusalem in the sixteenth century—the comparatively "modern" wall—was prepared by Mr. Geo. Jeffery, an English architect who has taken much interest in eastern architectural remains, and who has himself carried out some modern buildings at Jerusalem.

The plan is intended as an accompaniment to and illustration of the first article in the present issue.

ARCHITECTURAL PHOTOGRAPHS. — We have received from Mr. C. R. H. Pickard, photographer, of Leeds, a number of specimens of photographs of architectural subjects, which we can cordially praise. They are especially clear in definition of detail, which is a most important point in architectural photography.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

22.—JOINTS IN PIPES.

THE plumber has now to deal not only with lead, but also with brass, iron, copper, pottery, and other materials, and must be able to make perfect joints not only between two pieces of the same material, but also between any two different materials. Skilled workmanship is essential in this department of the plumber's duties, as, however good the sanitary fittings in a building may be, the exclusion of foul air will not be ensured unless every joint in the internal waste-pipes, ventilation-pipes, and soil-pipes is absolutely watertight and airtight. It is often thought that the same care is not necessary in the case of external pipes, such as soil-pipes, but when it is remembered that these generally serve also as ventilation-shafts for the drains, and are therefore conduits for foul air, and that air escaping from defective joints may be drawn into the building through open windows, it must be admitted that even in external pipes the workmanship must be of the best.

Lead to Lead.—The joint which the plumber is most frequently called upon to make is that between two pieces of lead pipe. Two kinds of joint are in common use—the copper-bit joint and the wiped joint. In both cases the two pipes are united by solder, which is a mixture of tin and lead. The proportions vary according to the work in hand. "Plumber's solder" contains about two parts (by weight) of lead to one of tin, and is generally used for wiped joints; "fine solder" is composed of lead and tin in equal quantities, and is used for copper-bit joints and seams and for "tinning" brass-work preparatory to making a wiped joint; "strap solder" is often made of one and a half parts of lead to one of tin, and is used for copper-bit joints. Into the practical details of shaving, tarnishing, &c., we need not enter. It will be sufficient for our purpose to describe the joints in a general way. Copper-bit joints are easily made, and require only a small quantity of solder. They are therefore often used by incompetent workmen, and by the worst sort of speculating builders. The lower of the two pipes has its upper end dressed out to form a tapering socket (fig. 1), and the lower end of the upper pipe is rasped outside and slightly opened to fit closely into the bottom of the socket. A piece of strap solder is then placed in the socket around the upper pipe and melted by the heated copper-bit or by the blow-pipe, so as to flow down to the bottom of the socket and adhere to the surfaces of the two pipes. As tin melts at a very much lower temperature than lead, there is a danger of the tin in the solder running through the joint and solidifying inside the pipe. To prevent this, the end of the inner pipe is sometimes "smudged over." In any case the copper-bit joint is weak and is easily damaged by the weight of the pipes and by their expansion and contraction. It ought never to be used in internal waste-pipes or soil-pipes, and is, indeed, prohibited by some sanitary authorities. The joint is, however, often made between the brass tail-pipes of lavatories, baths or flushing cisterns, and the lead traps and flush-pipes, as in many cases the tail-pipes are too short for wiped joints to be made. It is obvious that joints in these positions are not as important as joints in waste-pipes and soil-pipes.

The "overcast" copper-bit joint is strengthened by a thin flat band of solder, which is not wiped but brought to a smooth surface with the copper-bit. It is sometimes used for making the connexions to short tail-pipes. The copper-bit joint when used for external soil-pipes is often strengthened and ornamented by means of a lead astragal and fillet, as shown at A in fig. 2. Lead tacks B B for supporting the pipe are generally soldered to the back of the pipe immediately below the joint, and a second or dummy astragal, C, is soldered round the pipe close to the bottom of the tacks. A similar appearance is obtained by the use of the cast-lead socket (fig. 3), but this involves the making of two joints, one at each end of the socket. The "century" patent lead socket (fig. 4) is strengthened by tinned perforated copper (24 B. W. G.) bedded in the middle of the lead both in the socket and tacks. This copper core is shown in elevation at A, the dotted lines representing the outline of the tacks; B is a horizontal section to a larger scale; and C a vertical section, showing the tacks in elevation with the four nail-holes at *n n n n*. The copper is continued into the recesses at the ends of the socket, so that the solder connects the pipe directly to the copper core, thus ensuring a stronger joint. The sockets are made either with flat backs for pipes fixed on the face of a wall, or with angular backs for pipes fixed in angles, and in sizes as follows:—

Internal Diameter.	Long Sockets.			Short Sockets.		
	Flatback. Width over all.	Angular. Width from angle.	Height.	Flatback. Width over all	Angular. Width from angle.	Height.
in.	in.	in.	in.	in.	in.	in.
1½	6¾	4½	5½	6⅞	4⅛	2⅜
2	7	4⅞	6	7⅛	4⅜	3⅛
2½	7⅜	5⅛	6½	7⅜	5⅛	3⅜
3	8¼	6	7⅛	9⅛	6	4⅛
3½	9⅛	7	8½	9⅜	7	4⅜
4	10⅜	7⅛	9	10⅝	7⅛	5⅛

Cast gun-metal round-headed nails, 2½ in. long, are supplied for fixing the tacks to the walls; the nails are made with ¾-in., 1-in., or 1¼-in. heads, left dull or "bright turned." The lead tacks can also be obtained of sufficient width to fold over the heads of the nails.

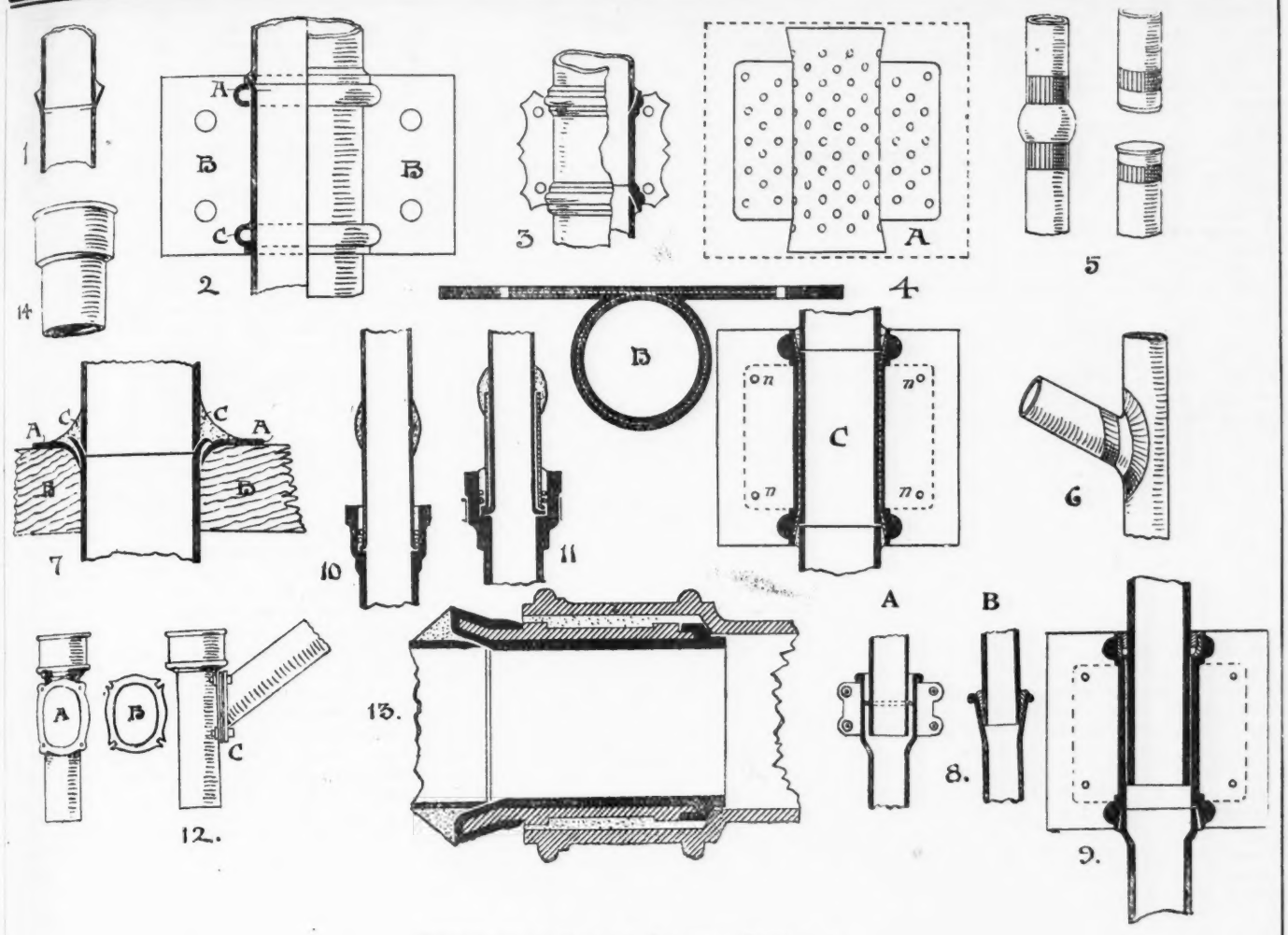
The wiped joint, also known as the "plumber's" or "round" joint, is the most generally useful joint for lead pipes. It may be used for connecting two pipes in the same straight line, when it is often known as an "underhand" wiped joint, and also for uniting one pipe to the side of another, when it is known as a "branch" wiped joint. In the underhand joint (fig. 5), the ends of the two pipes are formed in a somewhat similar manner to those in a copper-bit joint, but the whole of the joint is covered with a mass of solder, wiped with a cloth to a round shape. The joint is therefore much stronger than the copper-bit joint, and if properly made is perfectly watertight and airtight. It is undoubtedly the best form of soldered joint for lead wastepipes and soilpipes. Fig. 6 shows a wiped branch joint suitable for a soil-pipe. Considerable skill is required to make a perfect wiped joint; notwithstanding the mass of solder weeping often occurs, especially in service-pipes conveying water under great pressure. Some plumbers therefore "overcast" their wiped joints by running the copper-bit over them, as this gives a smoother and closer surface to the solder, but the practice is not looked upon with favour in this country.

The "block" joint (fig. 7) is a soldered joint used for vertical lead soil-pipes fixed in chases. It takes its name from the wood or stone blocks which support the joint. The upper end of the lower pipe is passed through a lead flange, A, resting on the block B, and is then opened out to form a socket, into which the lower end of the upper pipe is fitted. The joint is then completed with the solder C. Two methods of finishing the end of the lower pipe are shown. The upper edges of the blocks ought to be rounded to prevent cracking of the lead. A similar joint is often made in pipes passing through a floor, the floorboards taking the place of the block.

An inferior form of joint is made by tafting back the upper end of the lower pipe so as to form a flange. The upper pipe is fitted to this as in fig. 7, and the joint completed with solder. The lead is often seriously weakened in tafting it back, and a separate flange is therefore much better.

The "slip" joint is made by slightly opening out a short portion of the lower pipe to form a cylindrical socket into which the upper pipe is slipped, a coat of red and white lead or a little putty being relied upon to make the joint tight. Needless to say, joints of this kind are absolutely unsuitable for sanitary work.

Long lead waste-pipes from fittings discharging hot and cold water, such as sinks and baths, sometimes crack in consequence of the alternate expansion and contraction. To prevent this expansion oints are used. Two simple forms are shown in fig. 8. In that marked A the end of the lower pipe is formed into a socket about 5 in. deep by means of a hardwood mandrel; a vulcanised indiarubber ring is sprung on to the upper pipe close to the end,



Illustrations to Student's Column. Chapter 22.

and when this pipe is pushed into the socket the ring closes the annular space between them and is rolled to its final position. In the joint marked B an indiarubber cone with beaded edge is used, and the socket is conical, the upper pipe being slightly tapered to fit. Lead tacks are often soldered to the lower pipe at the joint for the purpose of fixing the pipe to the wall. The expansion joint shown in fig. 9 is formed by means of a lead socket and tacks with copper core like that illustrated in fig. 4, but with a tinned gun-metal screw-gland stuffing box, A, riveted to the copper body and tacks; the socket is made in sizes to receive 1½-in., 2-in., 2½-in., and 3-in. pipes. It is doubtful whether any of these joints will remain permanently tight.

Lead to Brass and Copper.—Joints between lead and brass or copper present no peculiar difficulty. After the end portion of the brass or copper pipe has been "tinned," it can be united to the lead pipe either by a copper bit or a wiped joint.

Lead to Iron.—In uniting lead to iron, a flanged brass or copper thimble or "sleeve" is generally used, as shown in figs. 10 and 11. In fig. 10 the lead pipe is united to the upper end of the thimble by a wiped joint, while in fig. 11 the lead pipe is passed through the sleeve-piece, the two being united at the top by a wiped joint. This is by far the better arrangement. In both cases the lower end of the brass or copper is placed in the socket of the iron pipe, and the joint completed by running the socket full of molten lead and thoroughly caulking it. A few strands of yarn must be caulked into the bottom of the socket to prevent the lead running through the joint into the iron pipe. The thimbles must be strong enough to resist the strains caused by the caulking tools. Brass thimbles can be obtained in two thicknesses, known as "light" and "medium," and in sizes increasing by ½ in. from 2 in. to 4 in. Brass sleeves are generally made ¼ in. larger in diameter to allow the lead pipe to pass through. As a rule thimbles and sleeves are of cast brass, but solid-drawn brass ferrules are now made in sizes varying by ¼ in. from 1¼ in. to 4¾ in. The brass connexions ought to be of sufficient length, so that the wiped joint will be quite clear of the iron socket. Connexions 1¾ in., 2¼ in., and 2¾ in. in diameter can be obtained from 3½ in. to 6 in. long, and larger sizes from 4 in. or 4¾ in. to 6 in. Heavy cast-brass sleeves for uniting lead to iron soil-pipes (4 in. in diameter) are made 4⅜-in. bore, 4⅞ in. over the flange, and 6½ in. long.

Another form of joint (fig. 12), known as Taylor's, is intended for uniting a lead branch to an iron soil-pipe. The iron junction-pipe is cast with an oval flanged opening, A, and a loose iron collar, B, is supplied of the same shape as the flange. The oval opening allows the branch to be made at various angles. The end of the lead branch must be cut to the required bevel, passed through the loose iron collar, and tafted back about three-quarters of an inch all round. The face of the iron flange is then covered with red-lead putty, and the joint is completed as shown at C by tightening the four bolts, the lead flange on the end of the branch being compressed between the iron flange and collar. This joint has been approved by the Sanitary Authorities in Manchester and other towns in the North of England, and has the advantage of being easily disconnected for the purpose of repairing the closet or soil-pipe. The same sizes of junction and collar are used for connecting a lead anti-siphonage pipe to an iron soil-pipe, but in this case a wide flange of sheet-lead must be wiped to the end of the lead pipe.

Robinson's "Enable" caulking thimble (fig. 13) is of iron covered inside with lead, which is also turned over to the outside of the iron at the top and bottom. A soldered joint can be made between the lead pipe and the lead covering of the thimble, and the annular space between the thimble and the socket of the iron pipe can be caulked with lead in the usual way. The thimble is of smaller diameter than the iron pipe to which it is connected.

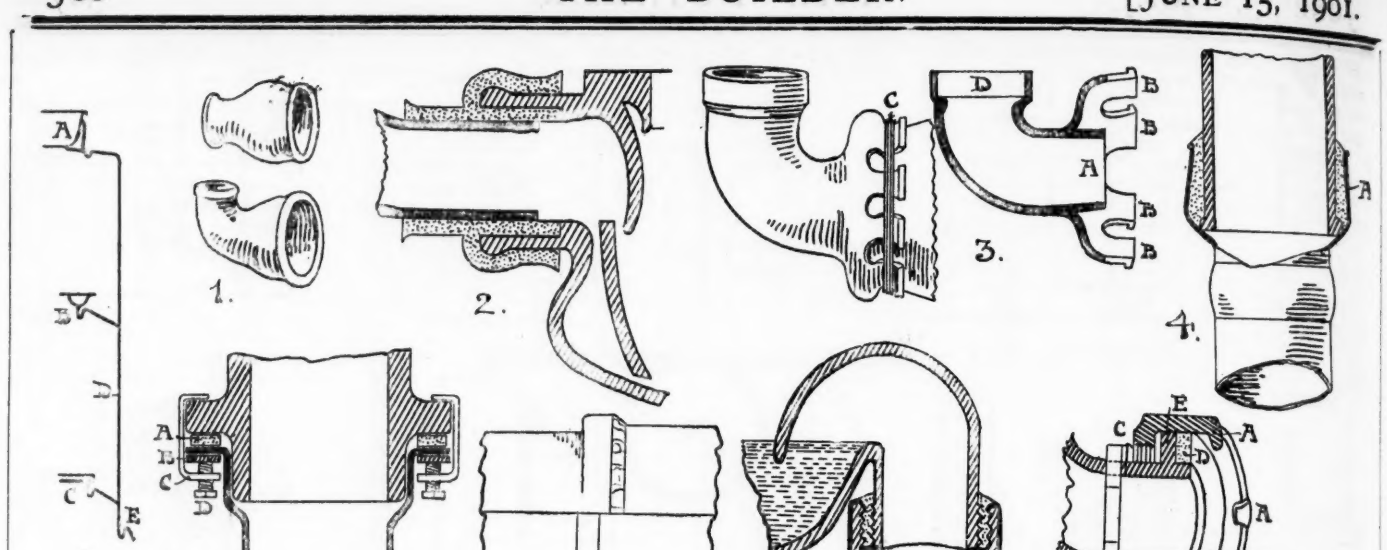
When the position of the lead and iron pipes is reversed—that is to say, when the flow of water is from the iron to the lead pipe—a different form of joint is required. A brass socket may be used with tinned tail. The spigot end of the iron pipe or trap is placed in the socket, and the joint completed with gasket and neat cement, or (better, if the brass is of sufficient strength) with gasket and caulked lead. The tinned tail is united to the lead pipe by means of a wiped joint. Sometimes a flange is cast on the outlet of the iron trap, and a corresponding flange is formed on the lead pipe by tafting; the two flanges are then bolted together with an india-rubber washer between. A loose collar of brass or iron is placed outside the lead flange, after the manner shown in fig. 12.

23.—JOINTS IN PIPES (*continued*).

LEAD TO POTTERY.—For connecting a lead soil-pipe to a stoneware drain, a brass sleeve, similar to those shown in figs. 8 and 9 of the preceding chapter, but with a wider flange for fitting into the stoneware socket, should be wiped to the lead pipe. The joint is completed by running the socket full of neat Portland cement, a few strands of gasket being first inserted to prevent the cement running through into the drain.

For connecting lead flush-pipes to the inlet horns of water-closets, slop-sinks, &c., india-rubber cones are generally used; both straight and elbow cones are made as shown in fig. 1. No paint or putty must be used in contact with the rubber, as these destroy its peculiar properties. Twyford's patent rubber connexion (fig. 2) makes a water-tight joint without having to wrap cord around it, as is often necessary when ordinary cones are used. The objections to the use of india-rubber have led to the introduction of a new form of joint, known as Fullerton's "Full-flush," shown in fig. 3. For lead flush-pipes the connexion is of lead. The spigot A is passed into the socket of the inlet horn of the closet, and the lugs B B are then bent till they come in contact with the outside of the horn; they are kept in position by copper wire wrapped round the horn, as shown at C. Red lead is spread on the contiguous surfaces to make the joint tight. The socket at D is intended for the reception of the flush-pipe, the joint being made with solder or red lead.

When the flow of water is from the pottery to the lead pipe, different forms of joint must be used. Brass washers and unions with tinned linings or tails are generally used for the outlets of pottery sinks, lavatories, and baths, and details of these have been given in the chapters on these fittings. The principal joint remaining to be considered is that between the trap of a water-closet or slop-hopper and the lead branch of a soil-pipe. The joint specified by the London County Council



Illustrations to Student's Column. Chapter 23.

(fig. 4) is made by means of a brass connexion A, into the socket of which the outlet of the trap is fitted, the annular space between the pottery and brass being then filled with neat Portland cement; the tail of the brass connection is tinned, and is united to the lead branch by means of a wiped joint. It is a good plan to have the socket of greater diameter at the bottom than at the top. A patent cast-lead "socket" is now made by Claughton Bros. to take the place of the brass socket; the socket portion is lined with iron, which is corrugated to offer a firmer attachment for the cement with which the annular space is filled. Sometimes a screw-thread is formed on the pottery outlet, to which a screwed lead socket is attached, but this joint can only be used when the outlet of the closet is specially made for the purpose.

A flanged joint can be made water-tight and air-tight, and has the advantage of allowing the closet to be easily removed in the event of damage being done either to the closet or branch. Flanged joints, however, ought always to be made above (and not at or below) the floor-level, and the screws ought to be tightened periodically. The old method of bringing the lead pipe through a hole in the floor and tafting it back to form a flange resting on the boards, and then covering the flange with red lead and screwing the closet through it to the floor, is now generally condemned. Fig. 5 represents a good form of flanged joint. The end of the lead pipe is opened out and tafted back to form a socket and flange; an india-rubber ring A is placed between the lead and pottery flanges, and a brass collar B is fitted under the lead flange to give the necessary rigidity. Three or more brass clips C are placed at intervals around the joint, and the connexion is completed by tightening the set-screws D.

Robinson's "Enable" connexion (fig. 6) consists of an earthenware socket corrugated inside and covered outside with lead. The joint between the socket and lead pipe is made with solder in the usual way, and that between the socket and pottery with neat cement. The socket is 2¼ in. deep, and is made in three diameters—3⅜ in., 4⅛ in., and 4½ in.

The pottery outlets of many modern water-closets and slop-hoppers are fitted into lead sockets, so that a wiped joint can be made directly between the latter and the lead branch pipes. The first joint of the kind was Doulton's "Metallo-keramic" joint (fig. 7). The pottery outlet is metalised, so that a lead socket can be united to it by means of a soldered joint; to the tail of this socket the branch pipe can be wiped in the usual way. This and kindred joints have been largely adopted, and are thoroughly satisfactory in the hands of good workmen.

Brass, Copper, &c.—Brass and copper pipes may be united to other pipes of the same materials by screwed ends or by screwed unions, brass and copper pipes to lead by soldered joints, brass and copper to iron by caulked lead joints, as already described, or by screwed joints, and to pottery by cemented joints. A special brass connexion is made for uniting a brass flush-pipe to the inlet horn of a closet (fig. 8). When the connexion has been placed on the end of the horn, the clips A A A are pressed down over the projecting rim of the horn shown in section at B; the screw C is then tightened and makes a good joint by compressing the rubber ring D between the end of the horn and the brass flange E of the flush-pipe. For further details of connexions between pottery and brass, see the chapters on sinks, lavatories, &c.

Pottery to Pottery.—Joints of this kind occur at the outlets of closets connected directly with the drains. This direct connexion ought never to be made except in outbuildings, as it necessitates the drain being brought inside the building, and as one or more joints must be made below the level of the floor. A few strands of gasket should be gently caulked into the socket, and the socket should then be filled with neat Portland cement. Similar joints may be made in the pottery waste-pipes of laboratory and other sinks.

Iron to Iron.—The most important joints of this kind are those in iron soil-pipes and branches, and are almost invariably socket joints caulked with molten lead. In scamped work putty is sometimes used, but this is certain to lose its plasticity in time, and the joint ceases to be air-tight. A better joint is made by running the socket full of neat Portland cement, after first caulking into it a little yarn or gasket to prevent the cement passing into the pipe. Rust joints are also occasionally used, but the caulked lead joint is the best. A flanged joint is useful when it is required to fix a length of pipe to the top of a stack in such a position that the joint is above the eaves or wall. The flanges are bolted together, red lead or an indiarubber washer being interposed to make the joint tight. Iron sink-traps are sometimes made with screwed outlets for fixing into the screwed sockets of iron waste-pipes. The joint between a cast-iron closet hopper and trap is generally formed by means of flanges bolted together with a rubber washer between.

Iron to other Materials.—Various methods of uniting iron to lead and other metals have already been described. An iron soilpipe may be connected with a stoneware drain by a cemented socket-joint, and a pottery closet outlet may be connected to an iron branch-pipe by a bolted flanged joint with india-rubber washer, or by an iron socket made specially wide to receive the pottery and run with neat cement.

WASTE-PIPES.

The term "waste-pipe" may with advantage be confined to pipes receiving discharges from fittings which are used for personal ablution and for washing crockery, domestic utensils, vegetables, &c., while the term "soil-pipe" may be applied to all pipes receiving discharges from fittings used for the reception of urine and fæces. The latter class includes water-closets, slop-hoppers, and urinals. All other fittings will fall into the former class. Certain general rules are applicable to all waste-pipes—that is to say, to all pipes receiving discharges from washing-up sinks, lavatories, and baths.

1. All waste-pipes ought to be disconnected from the drains by being made to discharge over trapped gullies. Whether the end of the pipe may be connected to the side of the drain-trap between the grating and the surface of the water depends to some extent upon circumstances. Some sanitary authorities insist on the point of discharge being not less than 18 in. from the drain-trap; others require it to be immediately over the grating; and others, again, allow the connexion to be made into the side of the trap above the standing water. The first position is the best for the purpose of preventing drain-air passing up the waste-pipe, but unless the channel leading to the trap is protected by a grating, under which the waste-pipe discharges, it is apt to become choked with leaves, &c.

2. Every waste-pipe from a single fitting ought to be provided with a trap, fixed as close to the fitting as possible. In the case of ranges of similar fittings, such as lavatories, a main waste-pipe is often provided with branches to the several fittings, and the main waste only is trapped. The objections to this arrangement will be discussed in the next chapter. As a corollary to this rule, it may be said that waste-pipes must be so arranged that the water from any fitting must not be made to pass through more than one trap on its way to the external gully. Double-trapping is sometimes practised, especially when the waste-pipe is connected directly with the drain, but it is a great mistake. Such an arrangement is shown in fig. 9; the bath A, lavatory B, and sink C are separately trapped and connected to a main waste D, which is trapped at E. When the bath is emptied, the air contained between its trap and the trap at E must escape somewhere, and this will probably be done by forcing the trap of one of the lower fittings; again, the rapid discharge through the trap E will almost inevitably siphon out one or more of the traps above.

3. The traps of all long waste-pipes, and of all waste-pipes receiving discharges from more than one fitting, ought to be ventilated, in order to prevent the water being siphoned out of the traps. If the traps are properly ventilated and the waste-pipes are properly laid and jointed, there can be no objection to connecting two or more fittings to one main waste-pipe. The traps of single fittings with short waste-pipes are often left without anti-siphonage pipes; thus there is little necessity (as far as siphonage is concerned) to ventilate the trap of an ordinary kitchen sink, the waste-pipe of which is, perhaps, less than 3 ft. long. But the more rapid the discharge is from the fitting the more necessity there is for trap ventilation. An old-fashioned lavatory basin with, say, 1-in. plug and 1¼-in. trap and waste-pipe is much less likely to cause siphonic action in the trap than a modern quick-waste lavatory, especially if the latter is fitted with a trap and waste-pipe only 1¼ in. in diameter.

4. All long waste-pipes and all waste-pipes receiving the discharges from two or more

fittings ought to be carried up (full-size) as ventilation-pipes, the upper ends to terminate at suitable points above the neighbouring windows and at a sufficient distance from them. This may seem a counsel of perfection, but as waste-pipes often become foul, and unless ventilated contain air more or less impure, it is a good plan to allow a free current of air to pass through them. Waste-pipes from fittings on the upper floors of buildings are sometimes made to discharge over cast-iron rain-water heads, from which cast-iron rain-water pipes lead down to the gulley below. The iron heads and pipes are not only quickly corroded, but they are almost certain to be fouled, and the foul air escaping from the head and joints may be drawn into the house through the nearest windows. Even this arrangement is, however, better than a long unventilated waste-pipe fixed inside the building and buried, or half-buried in plaster.

5. Waste-pipes, like soil-pipes, ought to be fixed outside buildings wherever possible. The multiplication of pipes on the outside of a building is undoubtedly in some cases an eyesore, but if the sanitary fittings are grouped together this objection loses much of its force, and it is certainly better, if leaks occur, that they should not contaminate the air within the building, or damage the walls, floors, and ceilings; repairs can also be executed with less annoyance to the occupants of the building if the pipes are fixed outside. There is, of course, a slight additional danger of the pipes being frozen up in severe weather, but if the taps are perfect the danger is less than in the case of external soil-pipes, as the water passing through waste-pipes is often warm. If waste-pipes must be fixed inside the building they ought not to be buried in the plaster or in chases, but fixed with clips or tacks to backboards, so that they can be easily inspected and repaired.

6. Waste-pipes ought not to be connected to soil-pipes or drain-ventilating pipes, or to the traps of water-closets or slop-hoppers, but ought to be kept entirely distinct. An exception to this rule may be made in the case of washing-up sinks fixed by the side of slop-hoppers; the wastes from the sink may be connected to an inlet arm provided in the side of the hopper *above* the standing water of the trap.

7. All waste-pipes ought to be adequately supported so as not to drag heavily on the outlet of the trap. The seal of a trap may be destroyed by the trap being pulled out of shape by the weight of the waste-pipe.

8. Joints within the thickness of walls or floors ought to be avoided wherever possible; they ought to be in positions where they can be seen and repaired without difficulty. The waste-pipes from baths are often laid under the floors. This can only be avoided in the case of ordinary cast-iron independent baths by placing supports of wood or other material under the cast-iron feet. If these raise the bath too high for children's use, it is an easy matter to provide a movable step. This raising of the bath not only allows the waste-pipe to be laid above the floor, but affords facilities for dusting and washing the floor under the bath.

9. Overflow pipes from storage or flushing cisterns must not be connected with waste-pipes, but must be carried through the nearest external walls in a conspicuous position to serve as warning-pipes. These pipes need not be trapped, as the traps would probably be unsealed by evaporation; but hinged flaps may with advantage be fitted on the ends to prevent the inlet of air and dust. It is a mistake to connect the overflow of a *siphon* flushing cistern to the flush pipe, even if there are no water company's regulations to prevent it, as such a connexion interferes with the siphonic action of the cistern.

OPEN-AIR BATH, EAST HAM.—Councillor F. G. Francis recently opened the open-air swimming bath which has been constructed by the East Ham Urban Council in the Central Park. The bath has been constructed by the Council's own workmen under the superintendence of the Surveyor, Mr. A. H. Campbell. It has entailed an expenditure of 1,350*l.*, it is 90 ft. in length by 30 ft. in width, and of a depth tapering from 30 in. at the shallow end to 6 ft. at the deep end. The walls and floor are of concrete, finished with a surface facing of mosaic composition. There are fifty private dressing-boxes and two casual spaces for juveniles, and a chamber for a private bath. The water is supplied direct from the mains of the East London Waterworks Company, and the drainage is into the sewers of the Council.

OBITUARY.

THE LATE MR. HOPKINS.—The following additional particulars in regard to Mr. W. J. Hopkins, the late Diocesan Architect of Worcester, whose death was briefly recorded in our obituary column last week, reached us just too late for insertion in that issue. Mr. Hopkins was, we believe, articled to the late Mr. Underwood, of Oxford, and early in life settled in Worcester. One of his first works was the erection of the Corn Exchange, now the Public Hall, in Worcester. He restored the following churches: Norton, Upton Snodsbury, Grafton Flyford, Flyford Flavel, Kingston, Besford, Witford, Doddington, and several others. He designed the following new churches: Suckley, Hallow, Blackheath (near Birmingham), Wilden, Abberton, Holy Trinity, Worcester, and some others. He cleverly adapted the beautiful fourteenth century roof of the Gueston Hall to the new church of Holy Trinity, where it still remains as a standing reproach to the cathedral authority of that day, who caused the removal of the Gueston Hall. Mr. Hopkins was the architect of the new Parsonages of Bradley Green, Norton, and Tibberton, and of many new houses at Sidcup, Ascot, and Malvern; and the mansions of Parkfield (Worcester) and of Kildangan (County Kildare). The latter was his last important work.

MR. W. H. LORDEN.—We have to record the death of this well-known contractor, which occurred suddenly at Southsea on the 8th inst. Mr. Lorden was born in 1837, and for many years was with Messrs. Lucas Brothers and carried out a number of their most important works. In 1871 he commenced business in Upper Tooting as a builder and contractor, and was senior partner until 1897 in the firm of W. H. Lorden & Son, retiring on account of declining health. Among the important works he carried out are the Croydon new post-office; soldiers' home, Westminster; several schools for the London School Board; Roman Catholic church, Streatham; St. Anselm's Church, Streatham; St. John's Church, Balham; new tower, &c., Framfield Church, Sussex; large blocks of artisans' dwellings at Marylebone and Wapping; infirmary extension, Kingston; nurses' home, Chelsea; several public libraries; stabling and depot for Wimbledon Urban District Council, &c.

GENERAL BUILDING NEWS.

BATH ABBEY.—The Bishop of Bath and Wells dedicated a few days ago the west front of Bath Abbey, which has just been restored under the advice of Mr. T. G. Jackson, R.A. The cost of renovation, so far as the west front is concerned, has been about 2,000*l.* The more expensive work of repairing the flying buttresses, which was not originally contemplated, is still proceeding.

CHURCH, GREENBANK, BRISTOL.—On the 1st inst. the new mission Church of St. Anne's, Greenbank, was dedicated. The room may be arranged to accommodate 400 persons, and has a vestry attached to it. The designs were by Mr. G. H. Oatley, and Mr. G. Humphreys was the contractor.

CONGREGATIONAL CHURCH, CHURCHTOWN, SOUTHPORT.—A new Congregational Church, which has been built at Churchtown, and has been erected from the designs of Mr. F. B. Halsall, architect, of Southport, has just been opened. The new building, the foundation stone of which was laid on July 18, 1900, consists of a new church with minister's vestry, Christian Endeavour room, choir vestry, classroom, and organ chamber. The church itself will seat about 700, the greater part of the sittings being on the ground floor, and the remainder in the gallery. Three entrances in the front lead to vestibules, the central doorway and vestibule being of greater width than those at the sides. These side vestibules each have a staircase to the gallery. The one on the north corner is octagonal on plan, and is carried up as a tower. There is also a side entrance leading to the vestry, Endeavour room, and choir gallery, a special staircase being provided for the use of the choir adjoining the vestry. The church is 57 ft. 9 in. by 42 ft. 6 in. inside on ground floor, the length on gallery level being 64 ft., exclusive of choir and organ gallery, which is 18 ft. by 17 ft. The Endeavour room is 29 ft. by 16 ft., and the internal height of the building is 36 ft. The roof is of pitch-pine of an ornamental character, the central portion being carried upon iron columns, the columns also supporting the gallery. The elevations are in pressed brick and Cullingworth stone. The principal front consists of a large central compartment, with the tower staircase on the north side and a lower structure for the south staircase. A four-light traceried window occupies the central portion of the front, with a single-light window at each side. The octagonal tower has buttresses on each angle, and is finished with flat roof and battlemented parapet. Two sides of the tower contain traceried windows, with hood mould and carved finial. The side elevations are divided into compartments by weathered buttresses, with two stories of windows between. The heating is by low-pressure hot water. The building is fitted with the electric light.

WYCLIF BAPTIST CHURCH, ELSWICK-ROAD, NEWCASTLE-ON-TYNE.—The foundation stones of this building were laid on the 5th inst. The style is Perpendicular Gothic, freely treated. The accommodation in the church is for 306 adults, or for a mixed congregation of about 360. A future end gallery is provided for, to seat 100 adults or 120 mixed, or an eventual total of 470 mixed. The choir is on the platform in front of the pulpit; and the baptistry is also in the platform, covered when not in use. The organ is in an apse behind the pulpit. The building consists of a wide nave, with hammer beam, open timbered roof, and plastered ceiling, and double transepts on each side, with timber arches supported on iron columns, each transept being lighted by a three-light traceried window. Two two-light traceried windows will be placed in each side wall of the nave. There will be a projecting portico in front, with vestibule and inner lobbies with swing doors; and a vestry on one side and a staircase on the other side in the tower, leading down to the school and up to the gallery in the future. A staircase on each side of the pulpit will lead down to the school below the church and to the minister's and deacons' vestries. A ladies' vestry will be behind the pulpit. The seating is arranged semi-circularly on plan, so that every hearer directly faces the minister. The heating will be by hot water pipes and radiators. There is an exit door from the tower and another from the back into Northbourne-street, the two front entrances being from Elswick-road. All doors open outwards. There is a spacious school under the church, and a church parlour, 19 ft. by 13 ft., also heating chamber and lavatories, &c. The school will be well lighted by large windows into areas and streets. The windows are glazed with leadlights, and the external walls faced with red pressed facing bricks, with tawny terra-cotta dressings and tracery, &c. The contract for the building is 4,383*l.*, including boundary walls, gates, railings, &c., but exclusive of upper portion of tower. The builder is Mr. Alexander Bruce, Newcastle. The architects are Messrs. George Baines & Reginald Palmer Baines, Clement's Inn, Strand, London, W.C.

BAPTIST CHAPEL, SOUTHEND.—A new Baptist chapel, constructed of red brick with Bath stone dressings, has just been opened at the junction of Avenue-terrace and Milton-road. The chapel is 78 ft. long and 60 ft. across in its widest part, the width at the back, where the side seats are not continued, being 36 ft. At the back of the rostrum is accommodation for the choir. Provision has been made for the erection of galleries along the sides of the chapel and at the end; and the main entrance has been constructed to admit of its being surmounted by a tower. A church parlour is connected with the chapel, and there are also the minister's and deacons' vestries. A Sunday school has been built, the length being 57 ft., and the width 32 ft. The architect is Mr. F. E. Smee, and the builders Messrs. Davis and Leaney. The contract price, exclusive of the site, is 6,000*l.*

PRESBYTERIAN CHURCH, CARDIFF.—The foundation stones were laid recently of a hall in connexion with the Cardiff forward movement work of the Presbyterian Church of Wales. The new building is being erected on a site at the junction of Keppoch-street and Plasnewydd-square. Mr. W. Beddoe Rees is the architect, and his designs were selected in competition. The new structure will provide seating for 850, and will, when completed, cost about 4,000*l.*

BOARD SCHOOL, CHESTERFIELD.—A new school, to be called the Central School, has been erected by the Chesterfield School Board, at a cost of 15,000*l.* Besides affording accommodation for ordinary teaching, the school buildings include provision for a pupil-teachers' centre, sufficient for an average attendance of thirty-six; a cookery centre, for fifty-four girls; a laundry centre, for forty-two girls; and also a swimming-bath. The bath is 75 ft. by 20 ft., and has a depth of water running from 3 ft. to 6 ft. 6 in. There are in connexion with it slipper and foot baths, and forty dressing-boxes. The school is built of Ellistown pressed bricks, with facings of buff terra-cotta. The roof is covered with blue slates, and the woodwork is painted green. There are six entrances, one being set apart for the pupil-teachers' centre. The interior has been planned to accommodate 1,200, and there are three floors, the floor space covering three-quarters of an acre. The basement contains the swimming-bath, the laundry, the cookery centre, and covered playgrounds. The ground floor consists of a central hall, 90 ft. by 30 ft., and eight classrooms, each 24 ft. by 24 ft., and accommodating sixty scholars. A feature has been made of the baby department, which will take in sixty children. The first floor also has a large central hall and a like number of classrooms, which, as below, are divided from the central hall by glass screens. There is a special playground for each department. The furniture has been supplied by the North of England School Furnishing Company, Darlington, and Messrs. Illingworth, Ingham, & Co., Leeds. Messrs. Tiltman (London) and Cecil Jackson (Chesterfield) are the architects, and the contractors were Messrs. Kellett & Co., Leicester.

BANK, LIVERPOOL.—On the 5th inst. the business of Parr's Bank, Limited, hitherto conducted at 14, Cook-street, was transferred to the new premises, 22, Castle-street. Externally, the lower walls are of unpolished granite from the Kemnay Quarry

Aberdeenshire. The walls of the first floor and upwards are faced with marble quarried at Pavonazza, relieved by green bands of Cippolino marble. The architraves of the windows and the cornice of the building are of red terra-cotta. Two rows of dormer windows rise through the high-pitched roof, and the building is the highest in Castle-street. The banking hall is a circular building 60 ft. in diameter, and lighted by a circular cupola 20 ft. in diameter. The walls are wainscotted in oak, and the eight supports are adorned with bands of Cippolino marble, and a cartouch containing an oval slab of Brescia marble. The floor is laid in marble and York stone and asphalt, from the design of Mr. Norman Shaw. The counter is built of Istrian marble, with a mahogany top, the rim being inlaid with boxwood and ebony. The basement is used partly for clerks' cloakrooms and lavatory, and also for the bank's strongrooms. The bank is to occupy the ground floor and basement and entresol; the upper floors are to be let for offices, and have already been partly taken. The architects were Mr. Norman Shaw, R.A. (London), and Messrs. Willink & Thicknesse (Liverpool), and the contractors Messrs. Jones & Sons, Liverpool.—*Liverpool Post.*

NEW POLICE STATION, BERWICK.—A new police-station has just been opened at Berwick. The site of the new buildings has a frontage to Church-street of nearly 70 ft. The principal elevation is of polished sandstone, the roof being covered with red Staffordshire tiles. The design is Renaissance in character. The ground floor is occupied for the most part by the police station, with entrance about the centre of the main front, and consists of charge-room, chief constable's office, parade-room, and seven cells. The upper floor is devoted exclusively to the police court and rooms connected therewith. The court room is 40 ft. long by 21 ft. wide. A public gallery, with direct access from public staircase, occupies one end of the room. A magistrate's room, a magistrate's clerk's room, and room for witnesses are placed opening off a upper hall approached by the public from the staircase entered on the south side of the main building, and by the magistrates from staircase under tower, with entrance from Church-street. In the rear of the site a house for the superintendent is provided. The design was selected in open competition. The contractors were Messrs. Bruce & Sons, Kelso, mason work; Messrs. J. & F. Forrest, Edinburgh, carpentery and joinery; Messrs. Rule & Sons, Tweedmouth, slating and plastering; Mr. Geo. Macadam, Berwick, plumbing; Messrs. J. Turner & Son, Berwick, concrete and cement work; Mr. R. J. Richardson, Berwick, painting; Mr. Thomas Thompson, Berwick, supplied the grates, mantles, and wrought-iron work. Mr. Hugh Steel acted as clerk of works, the architects being Messrs. Cackett & Burns Dick, Newcastle-on-Tyne. The cost of the new building was estimated at 4,945*l.*

PROPOSED ASSEMBLY BUILDINGS, BELFAST.—The plans of the Assembly buildings it is proposed to erect for the Presbyterian Church of Ireland have been prepared by Messrs. Young & MacKenzie.

WAREHOUSES, BELFAST.—Warehouse buildings are to be erected for Messrs. J. Fulton & Co., Limited, on the site of the old "House of Correction" in Howard-street. The contractors are Messrs. J. Henry & Sons, and the architects are Messrs. Young & Mackenzie.

NEW CO-OPERATIVE PREMISES, ABERDEEN.—The following tenders for new central premises, Gallowgate, for the Northern Co-operative Company, Limited, have been accepted: Mason work, G. Hall; slater work, Alex. Adam & Co.; plaster work, Geo. Gibb; painter work, G. Watt & Son; ironwork, Jas. Abernethy & Sons. The total cost will be about 10,000*l.*; and Messrs. Brown & Watt, Aberdeen, are the architects.

CRICKET PAVILION, NEWPORT, MON.—A cricket pavilion was opened at Newport by Lord Tredegar recently. The building has been erected at a cost of 1,500., from designs by Messrs. Swash & Bain, architects, and is a two-story building of red brick, roofed with red tiles.

PROPOSED DRILL HALL, GRIMSBY.—It is proposed to erect in Doughty-road, Grimsby, a new drill-hall for the headquarter companies of the new Third Battalion of Lincolnshire Rifle Volunteers. Mr. F. W. Croft is the architect.

NEW UNION INFIRMARY, RICHMOND.—The foundation stone of the new infirmary and nurses' home, in course of erection by the Richmond Board of Guardians, was laid recently. The new premises will consist of six separate buildings, viz., female infirmary block, lying-in ward, nurses' home, male infirmary, lunatic wards and ambulance house and mortuary. The five blocks intended for habitation have been arranged so that they each run longitudinally N.E. and S.W. The female and male infirmary blocks are connected on each floor by corridors, from which short branches connect to the lying-in ward and nurses' home. Along the centre of the ground floor main corridor a trench is formed in which the various mains will be placed. The female block comprises ground, first, and second floors, each containing a large ward, which provides for twenty-four beds, a smaller ward containing three beds, a dayroom and duty-room, besides larder, linen store, brush store, and the necessary sanitary accommodation. Access to the twenty-four bed ward is obtained by folding doors from the landing at one end, and at the other opens on to an external balcony. The dayroom is 20 ft. in length. Adjoining the larder and stores is a branch passage, leading to the main sanitary annexe, which provides accommodation for each floor. The lying-in ward is placed next to the female infirmary, and is approached by a short branch from the main corridor. The ward has six beds and several duty and labour rooms. The dispensary is in the same block, but is approached by a separate entrance from the corridor. Respecting the nurses' home it may be mentioned briefly that the block consists of three floors, from each of which access is obtained to the main corridor. The ground floor contains nurses' dining and sitting-rooms, with separate dining-room for subordinate nurses or wardmaids, and a private sitting-room, with bedroom attached, reserved for the superintendent nurse. Kitchens, storerooms, and bedrooms are arranged with due regard to comfort and economy of space. The male infirmary is similar in arrangement to the female infirmary, and accommodation, as in the other case, is provided for eighty-one inmates. There is further some small provision for the lunatics—the accommodation being only for cases pending removal to the county asylum, and lastly, a small ambulance house and mortuary. The entire series of buildings is to be in stock brick, with brick facings of deep red, and the slating will be green. Mr. S. N. Soole is the builder and Mr. Edward J. Partridge, F.S.I., is the architect, and Mr. A. G. Barley, clerk of the works.

POST-OFFICE, BARNSTAPLE.—A new building to accommodate the post-office is to be erected in Cross-street, Barnstaple. It will be of two stories, and will have an entrance from Castle-street for the mails. The plans have been prepared by Mr. F. W. Petter, of Barnstaple.

SANITARY AND ENGINEERING NEWS.

BALMORAL BRIDGE.—The bridge over the River Dee at Balmoral, the Highland residence of the late Queen Victoria, has, during the past two months, been undergoing repairs under the direction of Sir William Arrol. The piers and structure have been strengthened and improved, and the bridge has now been reopened for traffic.

WISETON, DONCASTER.—A scheme of main sewerage and sewage disposal, prepared by Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, has been approved, and an immediate start is to be made with the work. The method of sewage disposal consists of treatment in self-acting bacterial tanks, the effluent from which will discharge into the adjoining water-course.

PIER, CROMER.—Lord Claud Hamilton opened a new iron pier at Cromer on the 8th inst. The pier has a deck 500 ft. long and 40 ft. broad, with bays extending to 60 ft. The head expands to a width of 112 ft. The engineers were Messrs. Douglass & Arnott, and the contractors Messrs. A. Thorne, B. Cooke & Co., and A. Fasey & Son.

FOREIGN.

FRANCE.—M. Edouard Aynard has been elected a member of the Académie des Beaux-Arts, in the place of the late M. Philippe Gille. The new academician, who is a Vice-President of the Chamber of Deputies, is the author of a number of interesting studies on the Industrial Arts and on museums.——The Municipal Council of Paris will consider, during next Session, the question of lighting the Tuileries Gardens, so as to facilitate their being opened to the public at night. The cost of the necessary installation is estimated at 95,000 fr.——The exhibition of the "Peintres Lithographes" at Paris (Rue Daubigny) has excited a good deal of interest. The exhibitors, who number twenty-seven, have not confined themselves to black and white work, but also exhibit studies in coloured lithography and in pastel.——The old church at Coulommiers, built in 1220 by order of Philip Augustus, and which is in a ruinous condition, is to be rebuilt with the funds from a legacy of 350,000 fr. left for the purpose.——A Society of Architects of the Côte d'Or has been founded at Dijon, M. Suisse, the present diocesan architect, being elected president.——The monument to the memory of M. Félix Faure is to be inaugurated shortly at Père la Chaise.——The Municipal Council of Paris has under its consideration a proposal to erect M. Saint-Marceaux's monument to Daudet, which was in the New Salon, in the Avenue Gabriel, Champs Elysées.——A society has been formed under the title of the "Société des Artistes Decorateurs," presided over by M. Dubufe, the object of which is to group together all the decorative artists, and to organise exhibitions of decorative art.——M. Emile Petit-Didier has been appointed official architect of the Department of the Meuse for the Arrondissement of Commercy, in place of M. Verneau, retired.——The sixty-eighth Congress of the Société Française d'Archéologie is to be held at Agen, and will terminate with an excursion in the Department of Gers. M. Lucas has been appointed delegate to the Congress from the Société Centrale des Architectes.——The city authorities of Marseilles are about to undertake shortly the important works voted by Parliament for the rebuilding and sanitation of the Bourse quarter. The cost of this undertaking is estimated at 50,000,000 francs.——An exhibition of the works of M. Alexandre Léon, the painter, has been opened at the Georges Petit gallery. M. Léon was a pupil of Puvis de Chavannes, and the collection of paintings, pastels, cartoons, and drawings in this exhibition, show something of the spirit of his eminent teacher, and are remarkable both for power of drawing and nobility of conception.——M. Barrias, the sculptor, has just completed a model for a monumental clock which is to be placed in Rue Vivienne, on the new buildings of the Bibliothèque Nationale. This clock, flanked by two figures symbolising "Day" and "Night," will be also decorated by a seated figure personifying "Study." The clock face will be surrounded by a laurel garland, accompanied by two torches connected by garlands with a helmeted head of Minerva placed above. The sculptures are to be in stone.

GERMANY.—The Emperor Frederick's museum now being erected in Berlin, opposite the Old Castle, will probably be inaugurated in October, 1903. The building is intended to preserve paintings and sculptures of the post-Classic period, especially of the Renaissance, as well as collections of engravings, &c. The site of the museum will be connected with the adjoining streets by two bridges leading to the open square on which the late Emperor Frederick's monument is to be erected. The paintings by Professor Augustus Vogel are approaching completion, and the statues representing the arts are being placed in position.—— An art exhibition opened in Berlin contains forty-five designs for the statue of Richard Wagner. One of the most interesting, perhaps, is that representing the composer seated in an arm-chair, as though thinking out a melody. In front of him stands a figure of Music, a majestic woman with a lyre, supporting another woman representing Poetry. The figure of a youth, representing Legend, kneels in front of them, and hands a crown to Poetry as a subject for composition. His symbol, a dragon, is lying in a hollow behind him, and two sphinxes, indicative of the mysteries of Wagner's music, are resting on the two sides of the monument.

MISCELLANEOUS.

ABERDEEN ARCHITECTS AND TRADESMEN.—The Society of Architects, Aberdeen, recently issued a notice to the various master tradesmen in the city, requesting that they should recognise only qualified architects in accepting contracts. In consequence of this, a second association of master slaters, which has been formed, has expressed the opinion that every man in business should have a free hand. The following notice has been issued by the secretary *pro tem.*:—"A meeting of those in favour of resisting the action recently taken by the Aberdeen Architects' Society in endeavouring to stifle competition and create a monopoly in the building trades, will be held in the Square Room, Music Hall-buildings."

A PATENT OFFICE GUIDE.—We have received from the Patent Office, where it is published, a "Guide to the Search Department of the Patent Office Library," forming No. 4 of the Patent Office Library Series. This gives directions as to the volumes in the library which may be most usefully consulted in the search after previous specifications, and a list of the headings under which inventions and patents are classified; also a list of trade names for various articles or inventions, with a column giving the definition of the nature of the object to which the trade name is applied.

THE PATENT OFFICE REPORT FOR 1900.—In his official Report for the twelve months ended on December 31 last the Comptroller-General of Patents, Designs, and Trade-Marks, under the Patents and cognate Acts, 1883-8, sets forth that whereas the number (23,922) of applications for letters patent is again less than that (25,800) for the previous year, the receipts from patents fees amounted to 204,140*l.*, as compared with 202,977*l.* in 1899, whilst the receipts from designs and trade-marks fees show a decrease in each instance. The total receipts amounted to 226,091*l.*, as compared with 225,700*l.* in 1899, the increase of the receipts from patents fees, in spite of the falling-off in the number of patent applications, being again due to a continued increase in the number of the annual fees paid for the renewal of patents. The Comptroller-General points out that the number of renewal fees paid in each year bears a more or less constant relation to the number of sealed patents dated from four to thirteen years previously, and that as the number of sealed patents has gradually increased, so the renewal fees have increased in a like ratio. The total expenditure, which includes 21,814*l.* upon new building works, amounts to 120,667*l.*; the surplus of receipts above payments is 105,424*l.* The corresponding totals for 1899 were 123,216*l.* and 102,484*l.* respectively. By the end of the year the fabric of the new Patent Office buildings (Messrs. Perry & Co. are the contractors) was completed, with the exception of the roof of the library. The whole cost of the works, together with the site and 8,800*l.* on account of furniture, is estimated at 162,500*l.*, and of that sum

nearly 130,000*l.* had been expended at the close of the year. The elevation in Southampton-buildings has been designed, we may here mention, by the Office of Works, so as to correspond with that of the block facing the garden-court of Staple Inn, which was designed by Messrs. Wigg & Pownall in 1843, but was modified in its details a few years ago for purposes of the Patent Office. The balance-sheet of income and expenditure enumerates the following items under payments: — Salaries (for a total staff of 306), 61,002*l.* 10s. 6d.; printing, drawings, &c., 23,500*l.*; and new building works, 21,814*l.* There are several other appendices to the Report. One of them tabulates the "countries of origin," and shows that in 1900 the applications derived from England and Wales were 13,775 (a decrease from 15,354 in 1899); the United States, 3,184 (a small increase); Germany, 2,631 (a small decrease); France, 946 (a small decrease); Scotland, 1,154 (a small increase); Austria, 418; Ireland, 371 (a small decrease); Belgium, 184; Canada, 156; Switzerland, 150; Sweden, 104; and Italy, 100; no other country contributed as many as 100. The numbers received from the United States, Austria, Denmark, Norway, and Switzerland exceeded those in any previous year, and there was an increase in the number of applications derived from Queensland, New Zealand, Sweden, China (Hong Kong excluded), Japan, and Egypt as well. The ebb of invention in the cycle industry, which developed so suddenly in 1896, still continues; inventions affecting acetylene generators have diminished by a ratio exceeding 25 per cent., and there is a decline under the heads of weaving, lacemaking, electrical lamps, drains, hydraulic machinery, and other categories. A remarkable feature of the applications for the year is the large increase in the number of inventions concerning electrical traction, and the Report says that more than a hundred applications were made by one firm of electrical engineers alone. There is, moreover, a marked improvement in the class-divisions for out-door seats for tramcars, &c., motor-cars, air and gas engines, automatical and non-automatical couplings for vehicles, rotary engines (including turbines), dynamo-electrical generators, switches, cut-outs, couplings, &c.; and electrical telegraphs and telephones, printing, coin-freed apparatus, machine tools, and photography, which attained its highest point since 1883. Of the applications themselves 549, or nearly 2·3 per cent., were made by women. Some calculations demonstrate that fifty patents have been sealed upon every 100 applications received, that out of every 100 patents sealed the number kept alive and allowed to lapse respectively are, after thirteen years, five and two; and that out of the 9,466 patents of 1887 were maintained 529, or 5·6 per cent., by the payment of annual renewal fees for the full period of fourteen years.

ELECTRIC LIGHTING, HOYLAKE, CHESHIRE.—On the 6th inst., Mr. H. P. Boulnois, inspector under the Local Government Board, held an inquiry at Hoylake regarding an application by the Hoylake and West Kirby District Council for permission to borrow 13,500*l.* for the extension of electric-lighting works and cables. Mr. Roderick Williams, Clerk to the Council, explained that the Council had already received sanction to borrow 27,000*l.*, but owing to the great demand for electric light they had expended this, and had really exceeded it by 3,000*l.* Mr. T. L. Miller, consulting electrician, gave evidence as to the plant and mains, and Mr. Thomas Foster, surveyor, detailed the construction of the buildings. There was no opposition.

PROPERTIES FOR SALE.—In the course of this month will be offered for sale by auction, at the Mart, the Tower Estate at Pangbourne, and the Ealing Theatre, together with the adjoining Lyric Restaurant and Assembly Rooms. The former property consists of about 340 acres, including Upper Bowden Farm and 148 acres of arable land. The mansion house, known as "The Towers," was built for the late Mr. John Donaldson by Messrs. Foster & Dicksee, after Mr. Belcher's plans and designs. It is described and illustrated in the *Builder* of November 26, 1898; July 8, 1899; and January 13, 1900. The theatre, restaurant, and assembly-rooms at Ealing, forming one block having a frontage to the Broadway, were built about two years ago upon the site of the old Lyric Hall, and cover an area of nearly half an acre. The designs and plans were prepared by Mr. G. H. Pargeter and Mr. Walter Emden (who was the consulting architect for the theatre portion). The contractors for the whole block were Messrs. Beer & Gash, of Wharf-road, City-road.

A NEW BURNER FOR INCANDESCENT GAS LIGHTING.—"The Self-Intensifying Kern Burner" is the name of a new burner for lighting streets and industrial works by incandescent gas light, which is being introduced by the Welsbach Incandescent Gas Light Company. The burner is a Kern burner so modified that with the comparatively large gas consumption of 10 cubic feet per hour, the head of the burner is made sufficiently small to fit into a No. 4 high-pressure Kern mantle, a slight alteration being made in the internal construction of the burner head. A glass chimney suspended from the lower end of a metal chimney in the upper part of the lantern surrounds the mantle, and the elongated chimney thus produced enables the so-called "self-intensification" to be effected without the aid of a greater gas pressure than that under which gas is usually supplied to consumers from the gasworks. A series of these new burners, arranged in lanterns of various designs, has been exhibited this week at the Niagara Hall, Westminster, and it is claimed that an illuminating power of 300 candles is obtained with a consumption of 10 cubic feet of gas per hour—a result very little inferior to that obtained from gas under 10 in. pressure, the use of which entails the provision of costly compressing apparatus.

ST. AUGUSTINE'S CHURCH, THOMAS-STREET, DUBLIN.—The decoration and carving of the Chapel of the Sacred Heart, which has been in progress for some time past, has just been completed in this church. The whole of the work has been carried out from the designs of Mr. George C. Ashlin, R.H.A., Dublin, and the supervision of the work for him was done by Mr. Thomas A. Coleman.

LEGAL.

EMPLOYERS' LIABILITY ACT.

SOME QUESTIONS AS TO THE CARRYING OF CEMENT.

AT Brompton County Court, on Monday, before Judge Stonor and a jury, Ingram Munday, a builder's labourer, Peabody-buildings, S.W., brought an action, under the Employers' Liability Act, against Messrs. Squire & Potter, builders and contractors, 17, Walton-street, Pont-street, S.W., claiming damages in respect of personal injuries sustained owing, it was said, to negligence on the part of the defendants or their servants.

Mr. W. M. Thompson, counsel, appeared for the plaintiff, and Mr. E. F. Leaver, counsel, for the defendants.

Mr. Thompson explained that the plaintiff, last November, was employed by the defendants upon a job at 95, Sloane-street. A large quantity of cement was being used, and for a time the bags were brought in by the back entrance. On November 10, it was found that some planks had been taken away from the back, making it difficult for any one to cross some excavations, and the general foreman on the job directed the plaintiff and other men to carry in bags of cement by the front entrance in Sloane-street, down some stone steps into the basement. The first thirteen steps went down perfectly straight and were well lighted, but two return steps at the bottom—at right angles to the thirteen—were in darkness. While carrying a bag of cement upon his back the plaintiff slipped or stumbled upon the first of these two bottom steps and fell, breaking his left leg. The plaintiff was kept in St. George's Hospital from the day of the accident until January 2, and from that date until March 6 he stayed at the hospital's convalescent home at Wimbledon. He (the learned counsel) submitted that the defendants' foreman had been guilty of negligence (1) in ordering the plaintiff to carry the cement down the steps when there was no handrail there, and when they were in semi-darkness, and (2) in not providing sufficient planks for the men to cross the excavations at the back, as they had done prior to the day of the accident.

The plaintiff bore out his counsel's opening statement.

Mr. Leaver said that he admitted his clients' liability under the Workmen's Compensation Act, but denied that there had been any negligence with respect to the accident for which the defendants were responsible.

In cross-examination, the plaintiff said that he had taken two bags of cement down the steps in question before the accident occurred. It was not a fact that he slipped from one of the first thirteen steps, which were well lighted. He held the bag with one hand, and was not aware that the proper way to carry a bag of cement was to hold it with both hands. Some men, in fact, preferred not to hold the sack at all, but allow it to simply rest upon the back and shoulders.

Mr. Arthur Morley, M.R.C.S., &c., formerly house-surgeon at the hospital, spoke as to the man's injuries, and said that the plaintiff would not be able to resume his ordinary work for probably two or three months.

Charles Smith, the general foreman on the job at the time of the accident, said that as it would have taken a considerable time to put down fresh planks at the back, he thought it best to tell the men to take the cement in by the front entrance. He would not, however, have sent the plaintiff down the steps with the cement if he had not considered the work perfectly safe.

For the defence, Frederick Henry Symes, another general foreman in the employ of the defendants, said that he considered it perfectly safe for the men to carry bags of cement down the steps in question; in fact, the remainder of the bags, after the accident, were taken into the basement by the same steps. When witness saw the plaintiff in the hospital, the man said: "It was a pure accident—no one was to blame. I stepped too far forward, and went down two steps instead of one."

William Horton, a labourer in the defendants' employ, stated that the plaintiff had said to him that it was a pure accident, and that he must have slipped. The witness went on to say that he would have preferred to carry the cement down the steps in question than along the planks at the back of the premises.

Cross-examined; After the accident a light was placed at the bottom of the steps.

Frederick Farthing, a scaffolder, stated that he carried the remainder of the cement down the steps after the accident.

Mr. Benjamine Banyard, a builder, said that he had inspected the steps in question, and had he been on the job he would not have hesitated in directing the men to carry the cement down the steps.

Cross-examined: Owing to a man, when carrying a bag of cement, having his head down, it was desirable that he should have "a certain amount" of light.

Joseph Green, a builder's foreman, said that he also had seen the steps in question, and considered it quite safe for a man to carry bags of cement down them.

Mr. William D. Squire, one of the partners in the defendant firm, said that he considered it perfectly safe for a man to carry cement down the steps in question. A handrail was not necessary, indeed, his experience went to show that had there been a handrail the men would not have used it. There would have been no difficulty whatever in the men having more planks at the back had they asked for them.

The jury found that the way down the steps was not safe for the plaintiff when carrying a bag of cement; that he was not guilty of contributory negligence; that he did not thoroughly understand the risk he ran, and voluntarily undertake the risk, but that he carried the cement down the steps simply in obedience to orders. This was a verdict for the plaintiff, in whose favour the jury assessed damages at 50*l.*

His Honour gave judgment accordingly, and allowed costs.

ACTION TO RESTRAIN ALLEGED OBSTRUCTION IN VILLIERS-STREET.

THE case of W. H. Chaplin & Co., Limited, *v.* the Mayor, Aldermen, and Council of Westminster came before Mr. Justice Buckley in the Chancery Division on the 11th and 12th insts.

This was an action by the plaintiffs, a firm of wine merchants, for an injunction to restrain the defendants from erecting or placing any structure or post on the west side of Villiers-street, Strand, in such a position as to cause an obstruction to the plaintiffs as occupiers of No. 10, Villiers-street. It appeared that the plaintiffs had offices and very extensive cellars in Villiers-street leased from the South-Eastern Railway, and the defendants were proposing to put up a standard for carrying an electric light which the plaintiffs contended would materially interfere with the loading and unloading of their vans.

Mr. Henry Terrell, K.C., and Mr. Hatfield Green appeared for the plaintiffs, and Mr. Astbury, K.C., and Mr. Eustace Smith for the defendants.

His Lordship in giving judgment said he thought it was obvious that to place a post where it was proposed to place one would affect the elasticity of the plaintiffs' proceedings, but the only right the plaintiffs could claim was a right as members of the public, and they could not assert their individual convenience against the convenience of the public in general. It had not been proved that the defendants were acting unreasonably in placing a post where they proposed to place it. Both in law and in fact, therefore, the plaintiffs failed, and the action must be dismissed with costs.

IMPORTANT POINT AS TO DILAPIDATIONS UNDER A COVENANT.

THE case of Terrell *v.* Murray came before a Divisional Court of King's Bench composed of Justices Bruce and Phillimore on the 11th inst., on a motion by defendant to set aside the judgment of the Official Referee in an action brought by Mr. A'Beckett Terrell against the defendant, Lady Murray, to recover a sum of money alleged to be due in respect of dilapidations under a lease of premises at No. 20, Harcourt-terrace, South Kensington. The lease was dated August 9, 1893, and granted to the defendant by a Mr. Taylor, and was for a term of seven years from September 29, 1893. The lease contained no covenant to repair, but the tenant covenanted to deliver up at the expiration, or sooner determination, of the said term the messuage with all fixtures attached thereto, in as good repair and condition "as it now is, reasonable wear and tear and damage by fire excepted." The plaintiff acquired the reversion of the lease from Taylor, and at the expiration of the term made a claim for 112*l.* under the above covenant. The action was referred to the Official Referee, who found that the sum of 39*l.* was due from the defendant, which included 12*l.* for painting the outside of the building, 2*l.* for repointing certain brickwork, and 5*l.* for repairing parts of the kitchen-floor which had become damaged by dry rot. The Official Referee held that the fact that the mischief which necessitated the above items of repair had arisen through lapse of time did not excuse the defendant from executing the repairs. From this decision the defendant now appealed.

For the appellant it was contended that the effect of the covenant was that the tenant was liable only for commissive waste and not for permissive waste, and that reasonable wear and tear included deterioration due to weather or to lapse of time, and that the items in question were not properly chargeable to the defendant under the covenant.

For the respondent it was contended that the tenant would be liable for commissive waste apart from the covenant, and also that under the covenant the tenant was liable to do such repairs as would prevent damage by time or weather, and that such repairs would include the painting of outside woodwork.

Mr. Justice Bruce, in giving judgment, said his opinion was that the meaning of the covenant was that the tenant was bound at the end of the tenancy to deliver up the premises in as good condition as they were in at the beginning, subject to the following exceptions, viz., dilapidations caused by the friction of air, dilapidations caused by exposure, and dilapidations caused by ordinary use. He did not think that outside painting was a thing the tenant was bound to do under the covenant, and as the amount due to the plaintiff would thus be reduced to the amount paid into court, there must be judgment for the defendant.

Mr. Justice Phillimore concurred, and the appeal was accordingly allowed and judgment entered for the defendant.

Mr. Shearman appeared as counsel for the appellant (defendant), and Mr. Bonsey for the respondent (plaintiff).

ACTION BY FOREMAN CARPENTER FOR PERSONAL INJURIES.

THE case of Simons *v.* The Birkbeck Building Society came before Mr. Justice Darling and a common jury in the King's Bench Division on the 11th inst., an action by the plaintiff, a foreman carpenter in the employ of Messrs. Nichols & Co., for damages for personal injuries sustained through the alleged negligence of the defendants.

It appeared from the opening statement of Mr. Kemp, K.C., that the plaintiff, prior to the accident, had been earning 55s. a week. He had saved some money, and was desirous of buying a house, but not having a sufficient sum laid by, he borrowed some money from the Birkbeck Building Society. The loan was returned in monthly payments, his wife being in the habit of taking the money to the Society. On August 13, however, the plaintiff took the money to the bank. Never having been there before, the plaintiff asked where he should go, and understood the porter to say, "Third floor on the lift." The plaintiff looked round, and seeing the entrance to the lift walked towards it. There was no light, and the plaintiff, instead of walking into the lift, fell down the shaft, a distance of some 15 ft., sustaining severe injuries. For over a month he was laid up and unable to do any work, and now he could only earn 45s. a week instead of 55s. In these circumstances he claimed damages for the injuries he suffered and for the loss of ability to earn the old rate of wages.

For the defendants it was contended that the lift door was only open some 8 in. or 10 in. at most, and that the plaintiff had opened it further so as to enter. The defendants alleged that the plaintiff had not suffered very serious injuries, having only sprained his ankle and bruised his ribs, and not broken them, as had been said.

John Valledy, a fireman in the employ of the defendants said that the plaintiff on the occasion in question asked him where ground-rent loans were repaid, and he replied, "On the fourth floor; the lift will be down in a minute." Soon after witness heard the lift door open, and he thought the lift had come down. Then he heard the plaintiff fall, and he went and helped him up.

Cross-examined: The lift-attendants' orders were to keep the lift door locked. It was not locked on this occasion

In the result the jury awarded the plaintiff 150*l.* damages.

Judgment accordingly.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

2,702.—A BRAKE DYNAMOMETER: *E. H. Rieter.*—For an electro-magnetical brake dynamometer a ring that will make a slightly rocking movement, limited with stops, carries a series of magnetical poles; a heavy metal ring is caused to rotate within the rocking ring, with the shaft, and the amount of weight upon an extended arm which may be needed for preventing the rocking ring from being moved under the induced currents will give a measure of the power employed. In another form the ring may be fixed and the poles may rotate.

2,714.—A DEVICE FOR USE WITH WATER-HEATERS: *H. T. Fenlon.*—In order that the gas supply of a geyser or some similar water-heater shall not be turned on, or the water supply be turned off, independently the one from the other, the handle of the gas-tap is fastened in the closed position by means of its engagement with a pierced plate upon the handle of the water-tap. When the water-tap is opened the gas supply can be turned on and the water-tap handle cannot be closed beyond a certain limit. For use with a geyser the water-tap is connected to the boiler and the gas-tap to the burners, vessels being provided for the circulation of products of combustion to the chimney.

2,729.—TRIPOD STANDS: *W. Greenwood.*—Each leg consists of three rods, the two outer rods being joined at their lower ends with a clip through which the third rod will slide, and having two bands with guide-wings that hold the three rods together. When the two outer rods are caused to spring apart the bands will grip the inner rod, its action being aided by the spring portion of the clip. In the case of round rods the wings upon the bands are not required. Reference should be made to No. 14,652 of 1898 for the means of separating the group of three rods.

2,739-40.—CONSTRUCTION OF FIREPROOF AND SOUNDPROOF ROOFS, CEILINGS, FLOORS, &C.: *A. W. Green.*—Ribs are fashioned upon tiles for floors, ceilings, &c., so as to form insulating air-spaces beneath the girders, and in their undersides are dovetailed grooves which will take the plaster. Swivelling clips, or some such fasteners, secure the tiles to the lower flanges of the girders, and concrete is filled in over arches of sheet-iron. The spaces will serve for preventing the transmission of sound and for the laying of wires, pipes, and so on. For fireproof and soundproof floors and roofs are devised hollow blocks of terra-cotta, of which the V-shaped interlocking sides and dovetailed grooves will engage with the plaster and concrete, and the recessed ends with the flanges of the girders. The placing of the blocks is facilitated by the cutting away of their opposed diagonal corners.

2,759.—A COMBINED GAS AND COAL STOVE: *W. Youlten.*—In one form the gas-stove consists of two halves, right and left, each half being hinged upon its separated gas-supply pipe in order that it may be turned either in front of the coal fire or into recesses at the sides, which are provided with screens upon hinges. In another shape the gas-stove is pivoted on to its supply-pipe that it may be turned either up in front of the coal-stove or down into a box below the hearth. In another shape the two halves of the gas-stove are arranged in the recesses at the sides, in which case their screens can be folded in front of the coal-grate when the latter is not being used. Their flues are set by the side of the coal-fire flue, and the respective flues are cut off from the chimney with a register.

2,763.—A DRAWING-BOARD: *F. F. Gjellerup.*—A base, or underlayer, composed of two cardboard or similar sheets pasted together, is fitted between two parallel guides attached to the drawing-board. The upper surface of the underlayer is flush with the upper surfaces of the guides. To its top sheet is fastened a drawing-block, which is made up of a set of sheets held together with glued paper-strips, and is retained in its place within the guides with a small spring lock, whilst an elastic band holds a sheet of glazed or other paper that may be secured to the lower sheet of the underlayer.

2,774.—MANUFACTURE OF WHITE LEAD: *G. Bischof.*—The white lead, having been washed and pressed in a filter-press, is ground in oil without having been previously dried. White lead, about one-third, is pugged with oil, about two-thirds, the separated water is drawn off, then the remainder of the white lead and oil are added and pugged, and the superfluous water is abstracted by means of a current of heated air directed over the mixture when it is in the pugging mill. The white lead employed is obtained by the process specified in No. 11,602 of 1890.

2,775.—A DOOR-CHECK: *N. O. Bond.*—Blocks pivoted to rotating arms form a centrifugal block, the blocks being mounted so that they shall be free from an enclosing flange until the centrifugal force throws them out and, by causing them to rub against a leather lining of the flange, checks the motion of the door. A link joins the end of a lever to the door, and a pawl upon the lever engages with a ratchet-wheel set in connexion with the rotating arms of the brake.

2,842.—AN APPLIANCE FOR USE WITH ELECTRICAL CONNEXIONS: *E. F. Woodman and H. A. Fiske.*—In one form of the invention, which is devised for effecting a change of connexion when the temperature exceeds a certain limit, a cup or controller made of solder or some other fusible material is retained loosely upon a non-conducting cover by its flange. In the cup rests the lower end of a spring, which under normal conditions keeps the two contacts asunder. As the cup becomes melted the spring contributes to its disintegration, whereupon another spring falls upon one of the contacts so as to complete an alarm circuit. In another adaptation a different kind of spring is used for normally pressing the contacts together, the circuit being broken with the fusing of the cup.

2,867.—THE MOULDING OF BRICKS, PIPES, TILES, &C.: *C. Schlickeysen.*—In order that one machine may produce at the same time two or more different articles, the inventor provides side openings or dies as well as the customary mouthpiece or die at the end of the extrusion machine or pug-mill shaft. The lateral dies direct the clay by means of inclined or curved blades, which are set between rotary screw-blades, and may be extended parallel to the shaft. The mechanism allows for the changing of the dies and the mouthpieces can be lengthened or shortened so as to control the amount of pressure exerted.

2,871.—A KEY-LOCK: *H. Loose.*—In order that one or the other of two keys may serve the lock is made with two keyholes upon one side or upon both; the bolt is fashioned with two double key-ways, and has notches for engagement with a spring-controlled and vertically-sliding tumbler which either of the keys can operate, as its lower edged is inclined so as to ensure engagement with the key that fits one of the two keyholes.

2,876.—MECHANISM FOR CRANES: *W. H. Morgan and A. L. Taylor.*—In the case of cranes used in foundries the inventors contrive that the upper portion of the trolley shall be rotated upon a round truck by means of a motor-driven pinion that is set in gear, with and will run around a fixed rack upon the lower portion of the trolley; either one of a pair of endless lifting-chains is passed over either one of a pair of sprocket-wheels and hangs in two loops, the forging being hung in a short endless chain laid over a sprocket-wheel, which is driven with spur-gearing from two sprocket-wheels, over which the two lifting chains are passed. Of the two motors the one serves to drive the first-named sprocket-wheels in only the same direction, whereby the forging is turned simply upon its own axis; the other motor will drive those sprocket-wheels in opposed directions for raising or lowering purposes. If both motors are worked together the forging can be turned, and lowered or raised, at one and the same time.

2,886.—MANUFACTURE OF PORTLAND CEMENT: *W. A. O. Wuth.*—Burned lime mixed with water holding sodium nitrate in solution is added to ground blast-furnace slag, to compensate for its deficiency of lime and soda and to neutralise its too large amount of sulphide of calcium; for sodium nitrate may be used nitrates or chlorates of potash, lime, strontia, baryta, and so on, which will serve, albeit in a less degree, to convert the calcium sulphide into calcium sulphate, as oxidation ensues when the mixed slag and lime is burned in the shape of powder or bricks.

2,933.—EXTENSIBLE LADDERS: *A. Müller.*—At the back of the ladder is a cross-bar on to which are pivoted metal plates, to which are secured the back legs or supports of the ladder, the last-named parts being joined with links, whereof the common pivot works within a slot cut vertically in the cross-bar. With the extension of the ladder recesses on brackets take the plates, which then become locked with a pivoted catch to be turned down over the links; a cross-rod joins the brackets, which may have holding pins or recesses. For the employment of the steps as an ordinary ladder the back supports are rendered detachable, and one pivot of the main cross-bar will fit into a slot in one of the side brackets where a pivoted catch retains it in position.

2,938.—AN AUTOMATICAL MACHINE FOR SHARPENING CIRCULAR SAWS: *C. H. Clifton.*—A pivot which can be adjusted both horizontally and vertically with slides and screws holds the saw, across which a cam or crank upon a shaft feeds a grinding-disc that is carried upon the end of a swinging arm; two friction-discs—one of which a spring forces against the saw—feed the grinding-disc forwards; during the process of sharpening the saw is stopped from time to time through the action of a pawl which a lever forces aside out of the way; the pawl, upon its return, again stops the saw as it is being fed by the friction-discs; a stop upon the swinging arm, which impinges against a bell-crank lever, raises the grinding-disc at its stroke backwards, and a modified shape of the machine provides for a vertical raising of the pawl out of gear with the teeth of the saw, instead of its movement to one side.

2,964.—MOULDING OF PIPES, CONDUITS, &C.: *A. H. Howard.*—Pipes, conduits for electrical conductors, and similar goods are composed of a bituminous substance, which is moulded, when in a hot plastic or liquid condition, in a metal casing or around a skeleton of wire network or coil, which, together with the heated material, is placed within a closed mould; the mould is then rotated quickly in order that, through centrifugal action, the material may become spread evenly. The mould consists of two parts joined together with wedges forced between the claws of rounded and hinged straps; the rounded and recessed ends of the tubes are connected by the insertion of a hot dished block of iron between their adjacent ends and the pressure of the pipes together after melted bitumen has been laid over the joint.

2,989.—BURNERS FOR GAS-STOVES: *R. Oehme.*—A gas-inlet, a conical rim turned inwards, and a shallow casing of metal with feet constitute the burner. Upon the rim is laid a cone-shaped ring having two other rings above it; a middle disc, or plug, is laid upon the uppermost ring, being tightly screwed into the base with a screw and a key that fits two holes; notches cut in the upper edges of the rings, the central disc, and the outer rim form the gas-outlets for burning purposes.

2,996.—AN APPARATUS FOR USE IN DRYING, BURNING, AND SIMILAR FURNACES: *H. Herzfeld.*—For charging and discharging a drying-oven or furnace the goods are to be loaded upon the tray of a truck which runs upon rails into the oven, and when the truck has been pulled out the tray is lowered on to ledges with lever-worked cams; the tray is again lifted by the same means; screws, however, may be used for that purpose.

3,005.—TRAPS FOR GULLIES: *F. Staincliffe.*—For an improvement upon the contrivance specified in No. 4,528 of 1896 the inventor places the outlet on the side of the gully and fashions the trapping dish in a detachable form; he also adds a grating which is to be sprung into its place at the top of the gully, being made of a zig-zag spring of steel. Other modifications are available for use in stables and streets; in the latter instance he makes the trapping vessel rectangular in shape, and provides it with four supports.

MEETINGS.

FRIDAY, JUNE 14.

Edinburgh Architectural Association. — Annual excursion, to Hexham and Durham.

SATURDAY, JUNE 15.

Architectural Association. — Summer visit to Godalming and District to view some works by Mr. Lutyens.

Edinburgh Architectural Association. — Annual excursion (concluded).

St. Paul's Ecclesiological Society. — Visit to the Church of Sarratt. Train to Rickmansworth from Baker-street at 2.40 p.m.

MONDAY, JUNE 17.

Royal Institute of British Architects. — Professor W. R. Lethaby on "Education in Building." 8 p.m.

WEDNESDAY, JUNE 19.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

SATURDAY, JUNE 22.

British Institute of Certified Carpenters.—Visit to Hampton Court Palace. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 30.—By I. FARLOW (at Gipsy Hill).

Sydenham.—2 and 3, Porthcawe-road, f. £375

By J. R. EVE & SON (at Ampthill).

Ampthill, &c., Beds.—The Morris Estate, comprising about 881 acres, f. (in numerous lots).... 26,182

May 31.—By E. HOLSWORTH (at Stoke Newington).

Stamford Hill.—68, Alkham-rd., u.t. 66 yrs., g.r. 7*l.*, r. 40*l.* 405

By TYSER, GREENWOOD, & CRIER.

Chiswick.—Burlington-lane, a plot of building land, f. 430

Acton Green.—23 to 29 (odd), Cunnington-st., f... 1,490

June 3.—By BUNCH & DUKE

Fulham.—505 and 507, Fulham-rd., u.t. 55 yrs., g.r. 2*l.*, r. 95*l.* 1,300

481 and 483, Fulham-rd., u.t. 52 yrs., g.r. 15*l.*, r. 100*l.* 860

5 and 7, Maxwell-rd., u.t. 50 yrs., g.r. nil, r. 84*l.* 855

37, Moore Park-rd., u.t. 50 yrs., g.r. nil, r. 45*l.* 460

41 to 49 (odd), Moore Park-rd., u.t. 55 yrs., g.r. nil, r. 213*l.* 2,225

Hackney.—20 and 21, Gascoyne-rd., u.t. 27 yrs., g.r. 11*l.* 12s., r. 84*l.* 550

By EDWIN EVANS.

Cricklewood.—10 to 24 (even), Oak-grove, u.t. 94 yrs., g.r. 58*l.* 16s. 2,360

Stockwell.—18 to 28 (even), Hubert-grove, u.t. 73¾ yrs., g.r. 39*l.* 1,650

Harrow, Middlesex.—7, Headstone-rd., f., r. 28*l.* 390

Catford.—43 to 49 (odd), Creeland-grove, u.t. 62½ yrs., g.r. 16*l.* 350

By MAY & ROWDEN.

Streatham.—Woodfield-av., Adstock, u.t. 54 yrs., g.r. 22*l.* 9s. 1,400

By Messrs. RUTTER.

Peckham.—9, 11, and 23, Howden-st., u.t. 75½ yrs. g.r. 15*l.* 710

By FRED. VARLEY.

Leytonstone.—42 and 44, Park Grove-rd., u t. 85 yrs., g.r. 8*l.* 300

Hoxton.—90 and 92, St. John's-rd., u.t. 22 yrs., g.r. 9*l.*, r. 95*l.* 650

Finsbury Park.—6, Portland-rd., u.t. 57 yrs., g.r. 12*l.* 12s., e.r. 70*l.* 595

By G. A. WILKINSON & SON.

Bloomsbury.—43, Bloomsbury-sq., a profit rental of 270*l.* for 21 yrs. 2,550

Southwark.—213 and 315, Borough High-st., area 2,790 ft., f., r. 167*l.* 10s. 2,275

By R. & J. R. MITCHELL (at Cockermouth).

Brigham, Cumberland.—Beckhouse Estate, 80 a. 2 r. 16 p., f. 2,620

June 4.—By DEBENHAM, TEWSON, & Co.

Hampstead.—9, College-ter., u.t. 50 yrs., g.r. 10*l.*, e.r. 90*l.* 680

Shooter's Hill, Kent.—Brent-rd., Downham and 1½ a., f. 1,650

By HOLLIDAY & STANGER.

Plumstead Common, Kent.—13 to 18, Garland-st., u.t. 47 yrs., g.r. 8*l.* 11s. 625

Streatham.—20, Madeira-rd., f., r. 45*l.* 600

By LONG & SONS.

Hatfield Peverel, Essex.—London-rd., Springfield House and 8 a. 1 r. 25 p., f. 2,000

By E. & H. LUMLEY.

Maida Vale.—No. 34, area ½ a., u.t. 37 yrs., g.r. 75*l.* 1,600

By PEACEY & FULLER.

Harrow, Middlesex. — Gayton-rd., Brunswick House, f., r. 85*l.* 1,020

Hampstead-rd.—No. 219, f.g.r. 20*l.*, reversion in 6½ yrs. 1,150

Regent's Park.—102, Gloucester-rd., u.t. 50 yrs., g.r. 8*l.* 8s. 510

By RUTLEY, SON, & VINE.

Camden Town.—32 and 33, Georgiana-st., u.t. 38 yrs., g.r. 9*l.* 10s. 740

198, Gt. College-st., u.t. 39½ yrs., g.r. 8*l.*, r. 52*l.* 550

Kentish Town.—15, Lamble-st., u.t. 62 yrs., g.r. 6*l.* 6s. 195

78, Castle-rd., u.t. 62 yrs., g.r. 21*l.* 250

By E. FERGUSSON TAYLOR.

Forest Hill.—83, Stanstead-rd., f., r. 25*l.* 460

By WESTON & SONS.

Brixton.—34, 36, 40, 42, and 44, Eastlake-rd., u.t. 63¾ yrs., g.r. 25*l.*, r. 202*l.* £1,890

24 to 32 (even), Luxor-st., u.t. 63½ yrs., g.r. 35*l.*, r. 186*l.* 1,630

27, Gateley-rd., u.t. 71 yrs., g.r. 7*l.* 10s., e.r. 45*l.* 365

By C. P. WHITELEY.

Mitcham, Surrey.—Tramway path (near) two parcels of freehold land, 12 a., 1 r. 35 p..... 1,050

Morden-rd., f.g r. 24*l.*, reversion in 60 yrs. 700

Isleworth, Middlesex.—Twickenham-rd., Edbrook House, u.t. 62 yrs., g.r. 8*l.*, r. 25*l.* 280

By BATE & Co.

Hampstead.—64, West End-lane, u.t.'77 yrs., g.r. 25*l.*, r. 130*l.* 1,650

Maida Vale.—50, Sutherland-avenue, u.t. 62 yrs., g.r. 11*l.*, r. 60*l.* 650

By HUMBERT & FLINT (at Watford).

Watford, Herts.—2 and 4, Brixton-rd., f..... 520

Brixton-rd., enclosure of building land, f..... 1,050

2, 4, and 6, St. James'-rd., f. 1,000

69, Liverpool-rd., f. 195

Bushey, Herts.—20 and 22, Capell-rd., f. 700

By G. E. SWORDER & SONS (at Hitchiu).

Ardley, &c., Herts.—Hare-st. Farm, 70 acres, f... 1,020

By A. J. BURROWS (at Ashford).

Egerton, Kent.—Newland Green Farm, 13 a. 1 r. 16 p., f. 500

Little Chart, Kent.—Five cottages and 0 a. 2 r. 28 p., f. 245

Shadoxhurst, Kent.—Two houses, cottage, and 5 a. 1 r. 29 p., f. 385

By MORRIS & PLACE (at Nottingham).

Greasley, Notts.—The Babbington Estate, 81 a., f. 4,500

By HOLLIS & WEBB (at Leeds).

Leeds.—85 to 95 (odd), Park-lane, area 1,798 yds., f. 18,000

Addingham, Yorks.—Turner-lane Farm, 46 a. 2 r. 4 p., f. 1,430

By J. & W. JOHNSON (at Masons' Hall Tavern).

Victoria Park. — Wick-rd., the Elephant and Castle p.-h., u.t. 17 yrs., r. 95*l.* with goodwill 2,195

WM. ROLFE (at Masons' Hall Tavern).

Strand.—The Grecian p.-h. and the Temple Bar Restaurant, u.t. 68 yrs., r. 900*l.*, with goodwill 11,000

Finsbury.—Paul-st., the Crown and Anchor p.-h.; also 66, Leonard-st., u.t. 72 yrs., r. 78*l.*, with goodwill 15,500

By W. BROWN & Co. (at Amersham).

Chesham Bois, Bucks.—The Common, two enclosures of land, 10 a. 0 r. 11 p., f. 780

New-rd., an enclosure, 2 a. 2 r. 20 p., f..... 165

The Common, a building site, 1 a. 1 r. 24 p., f... 490

By FOLEY, SON, & MUNDY (at Trowbridge).

Southwick, Wilts.—Southwick Court Farm, 186 a. 3 r. 7 p., f. 8,000

Two allotments, 5 a. 3 r. 19 p., f..... 370

June 5.—By FOLEY, SON, & MUNDY (at Melksham).

Melksham, Wilts.—Woodrow Farm, 110 a. 0 r. 24 p., f..... 3,400

Normead enclosures, 22 a. 1 r. 34 p., f. 1,800

By Messrs. SPELMAN (at Norwich).

Norwich.—Thorpe Hamlet, The Lawn and 1 a. 0 r. 12 p., f..... 2,020

47, 49, 52, and 54, Thorpe-rd., f., r. 115*l.* 1,830

By WALTER PEARSON (at Pickering).

Pickering, Yorks...Enclosures of land, 9 a. 2 r. 20 p., f..... 800

A freehold house and 21 p..... 470

Aisiaby, Yorks.—Two freehold houses and 2 a. .. 400

Enclosures of land, 14 a. 1 r. 2 p., f. 625

Wrelton, Yorks.—Farmhouse and 17 a. 1 r. 3 p., f. 600

Cropton, Yorks.—Farmhouse and 26 a. 2 r. 31 p., f. 950

Enclosures of land, 9 a. 3 r. 1 p., f..... 515

June 6.—by C. H. BROWN.

Pimlico.—26, Cumberland-st, and 33, Clarendon-st., u.t. 32½ yrs., g.r. 10*l.*, r. 90*l.* 820

By G. F. FRANCIS.

Hackney.—85, King Edward's-rd., u.t. 38 yrs., g.r. 6*l.*, r. 36*l.* 315

Chelsea.—10, Smith-st., f., r. 60*l.* 990

By G. GOULDSMITH, SON, & Co.

Belgravia.—60, Chester-sq. and 60, Ebury-mews, u.t. 22½ yrs., g.r. 2*l.*, r. 260*l.* 2,850

South Kensington.—33, Egerton-cres., u.t. 26 yrs., g.r., &c., 17*l.*, r. 105*l.* 1,640

By C. C. & T. MOORE.

Whitechapel-rd.—Nos. 71, 73, and 75, c., r. 230*l.* 5,900

St. George's East.—79 to 91 (odd), Lower Chapman-st., f., r. 198*l.* 3,150

Mile End.—21 and 23, Morgan-st., u.t. 38 yrs., g.r. 7*l.* 16s., r. 74*l.* 750

Bow.—14, Caxton-st., u.t. 50 yrs., g.r. 6*l.*, r. 38*l.* 400

Stepney.—90 and 92, Nelson-st., u.t. 17 yrs., g.r. 20*l.* 200

25, Bedford-st., u.t. 14 yrs., g.r. 12*l.* 205

62, Oxford-st., u.t. 14½ yrs., g.r. 5*l.* 110

138 and 140, Oxford-st., u.t. 33 yrs., g.r. 10*l.* .. 830

137, 939, and 141, Oxford-st. and 117 and 119, Jubilee-st., u.t. 33 yrs., g.r. 24*l.* 1,080

Spitalfields.—22, Tenter-st., and 13, Shepherd-st., f. 1,300

Stoke Newington.—16, St. Kilda's-rd., u.t. 74 yrs., g.r. 7*l.*, r. 40*l.* 430

By NEWBON, EDWARDS, & SHEPHARD.

Somers Town.—6, 7, and 8, Charrington-st., u.t. 20 yrs., g.r. 19*l.* 10s., r. 135*l.* 655

Canonbury.—22, Compton-rd., u.t. 44 yrs., g.r. nil, e.r. 60*l.* 640

Holloway.—149 and 151, Hungerford-rd., u.t. 59 yrs., g.r. 12*l.*, r. 105*l.* 1,125

By STIMSON & SONS.

Folkestone, Kent.—139, Dover-rd., u.t. 42 yrs., g.r. 11*l.* 5s., e.r. 100*l.* 850

Willesden.—Hythe-rd., Westley Works, area ¾ a., u.t. 92½ yrs., g.r. 100*l.*, r. 250*l.* 1,600

Bow.—4, 6, and 8, Turner's-rd., u.t. 62 yrs., g.r. 15*l.* 830

148, Turner s-rd., u.t. 60 yrs., g.r. 5*l.*, r. 40*l.* .. 345

Walthamstow.—46 to 56 (even) and 56A, Spruce Hill-rd., f. 2,125

St. John's-rd., two plots of building land, f..... 120

Woodford.—West-grove, a plot of building land, f. 335

Chelsea.—8 and 9, Christchurch-ter., u.t. 50 yrs., g.r. 12*l.*, r. 70*l.* 740

Lee.—3, Church-st., f., r. 30*l.* 555

New Kent-rd.—No. 208A, u.t. 28½ yrs., g.r. 9*l.*, r. 35*l.* 165

Peckham.—3, Peckham Rye, u.t. 33¾ yrs., g.r. 6*l.* 10s., r. 60*l.* 610

Wimbledon.—26, Southey-rd., f., r. 45*l.* £650

By WILTSHIRE & THURGOOD.

Catford.—2, Barmeston-rd., u.t. 76 yrs., g.r. 10*l.* 10s., r. 40*l.* 300

Lewisham.—143, 145, and 147, High-st., u.t. 37 yrs., g.r. 25*l.*, r. 130*l.* 950

Forest Hill.—57, Houston-rd., u.t. 75 yrs., g.r. 5*l.*, r. 27*l.* 10s. 315

By E. WOOD.

Clapham.—150, Leathwaite-rd., u.t. 83 yrs., g.r. 6*l.* 10s. 260

Battersea.—29, Basnett-rd., u.t. 68 yrs. g.r. 5*l.* .. 250

12, Savona-place, f. 265

By A. ROBERTSON (at Camberwell).

Camberwell.—42, Vicarage-rd., u.t. 49 yrs., g.r. 8*l.*, e.r. 55*l.* 350

Kennington.—38 and 48, Shursted-st., u.t. 63 yrs., g.r. 12*l.*, r. 74*l.* 815

Brixton.—70, Acre-lane, u.t. 73 yrs., g.r. 12*l.* 12s., r. 50*l.* 385

Dulwich.—Green-lanes, Inisfallen, u.t. 67 yrs., g.r. 3*l.* 18s., r. 65*l.* 1,000

June 7.—By G. O. BALLARD.

Hampton Hill, Middlesex.—High-rd., The Hermitage, f., r. 52*l.* 850

By PERCIVAL HODSON.

Finsbury Park.—12, Adolphus-rd., u.t. 72 yrs., g.r. 10*l.* 10s., r. 52*l.* 550

Gray's Inn-rd.—16, Swinton-st., u.t. 40 yrs., g.r. 8*l.*, r. 44*l.* 500

By JONES, SON, & DAY.

Bermondsey.—Southwark Park-rd., f.g.r. 10*l.*, reversion in 30 yrs. 380

Limehouse.—Maroon-st., f.g.r. 20*l.*, reversion in 34 yrs. 620

34A, Three Colt-st., f., r. 25*l.* 515

Whitechapel. — 129 and 131, Bedford-st., f., r. 45*l.* 12s. 810

Hoxton.—3, 4, and 5, Leverington-pl., f..... 440

Silvertown.—445, North Woolwich-rd., f., r. 35*l.* 620

Edmonton.—66, Gordon-rd., r. 20*l.*; also Monmouth-rd., two plots of building land, f. 630

Walthamstow.—Copper Mill-lane, plot of building land, f. 135

Poplar.—Orient-st., the Oriental Tavern, &c., f.g.r. 13*l.* 13s., reversion in 56 yrs. 525

East Ham.—107, Barking-rd., f., r. 45*l.* 490

Limehouse.—139, Maroon-st., f., r. 19*l.* 200

Wanstead.—Grove Park, five plots of building land, f. 900

By F. J. BISLEY & SONS.

Bermondsey.—135, Alscot-rd., u.t. 25¼ yrs., g.r. 4*l.* 7s., r. 52*l.* 280

1, 3, and 5, Dockley-rd., u.t. 35½ yrs., g.r. 15*l.* 10s. 755

159, Fort-rd., f. 525

Deptford.—18, Chipley-st., u.t. 59 yrs., g.r. 5*l.* .. 200

13, Croft-rd., u.t. 64 yrs., g.r. 3*l.* 295

Camberwell.—86, Picton-st. and 2, Cork-st., u.t. 98 yrs., g.r. 7*l.* 275

4, 6, and 8, Cork-st., u.t. 98 yrs., g.r. 10*l.* 10s. 405

By BEARD & SON.

Bayswater.—Monmouth-rd., f.g.r. 15*l.*, reversion in 49 yrs.... 655

New Malden, Surrey.—4 and 5, Wellington-ter., f., e.r. 62*l.* 12s. 895

Lewisham.—3, Fordyce-rd., u.t. 80 yrs., g.r. 5*l.* 10s., r. 30*l.* 240

By W. A. BLAKEMORE.

Harrow, Middlesex.—3 and 5, Roxborough-pk.-rd., f., r. 130*l.* 2,650

Battersea.—2 and 4, Granfield-st., u.t. 80 yrs., g.r. 8*l.* 375

Brixton.—Chaucer-rd., Chaucer Cottage, with yard and stabling, u.t. 67 yrs., g.r. 4*l.* 10s. .. 760

By P. J. DIXON & SON.

Bow.—64, Campbell-rd., u.t. 61 yrs, g.r. 5*l.* 330

By SALTER, REX & Co.

Kentish Town.—54, Woodsome-rd., u.t. 61 yrs., g.r. 7*l.*, r. 38*l.* 510

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	14	0	per 1,000	alongside,	in river.
Rough Stocks and Grizzles	1	11	0	,,	,,	,,
Facing Stocks	2	12	0	,,	,,	,,
Shippers	2	8	0	,,	,,	,,
Flettons	1	8	6	,,	at railway	depot.
Red Wire Cuts	1	14	6	,,	,,	,,
Best Fareham Red	3	11	0	,,	,,	,,
Best Red pressed Ruabon Facing.	5	5	0	,,	,,	,,
Best Blue Pressed Staffordshire	4	4	6	,,	,,	
Do., Bullnose	4	9	0	,,	,,	,,
Best Stourbridge Fire Bricks	4	2	6	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamfered, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,,	,,

[*See also page 595.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Bridge Widening	Hamilton (N.B.) Corporation	15 guineas and 10 guineas	June 30
*Laying out Winter Garden	Penzance Corporation	21*l.* and 10*l.* 10s.	Sept. 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Draining, Kerbing, &c.	Hendon U.D.C.	Engineer, Public Offices, Hendon, N.W.	June 17
Offices and Tea Rooms, Kirkgate	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
Waterworks, Much Wenlock, Salop	Madeley & Broseley Water Comte.	Mr. Stooke, Civil Engineer, Severn Villas, Shrewsbury	do.
Seven Houses, Osborne-street, Barnsley		Wade & Turner, Architects, 10, Pitt-street, Barnsley	June 18
Eighty Houses, Bradford, Manchester	L. & N. W. Railway Company	Estate Offices, Exchange Station, Manchester	do.
Additions to Public Library	Edinburgh Corporation	R. Morham, Architect, City Chambers, Edinburgh	do.
Brick Tank, &c.	Rotherham Corporation	H. H. Copnall, Town Hall, Rotherham	do.
Pumping Station, &c.	Bradford-on-Avon U.D.C.	S. Howard, Surveyor, Town Hall, Bradford-on-Avon	do.
Farmhouse, Carlogas, near St. Columb		J. Smith, Churchtown, Grampound-road, Cornwall	do.
Showyard Buildings, Longtown, near Carlisle	Longtown Agricultural Society	J. S. Hewitson, Randalinton, Longtown	do.
Electric Light Station	Nelson Corporation	B. Ball, Civil Engineer, Town Hall, Nelson	do.
*Alterations, &c., to Dover Hospital	Dover Hospital	See Advertisement	June 19
House, Holywell Green, Halifax		Rev. W. Johnstone, The Manse, Holywell Green	do.
Church, Tynte, Penrhiwceiber, Wales	Rev. J. J. Lewis	E. M. Bruce Vaughan, Architect, Cardiff	do.
Additions to Club Buildings, Crosland Moor		J. Berry, Architect, 9, Queen-street, Huddersfield	do.
Stables, &c., Hexham	North-Eastern Railway Company	W. Bell, Architect, Central Station, Newcastle	do.
Stabling, Stores, &c., New Mills, Norwich		A. E. Collins, Civil Engineer, Guildhall, Norwich	do.
Lavatory, The Barbican	Plymouth Corporation	J. Paton, Engineer, Town Hall, Plymouth	do.
*Sewer Works	Hove Corporation	Borough Surveyor, Town Hall, Hove	do.
Ten Labourers' Dwellings	North Dublin R.D.C.	J. O'Neill, Council Offices, North Brunswick-street, Dublin	do.
School, Marsh Green	Dagenham (Essex) School Board	Harrington & Ley, Architects, 65, Bishopsgate-street, Without	do.
Villas, Lumley-avenue, Skegness	Mr. W. A. Parker	W. H. Bridges, Architect, Skegness	June 20
Additions to Wesleyan Church, Newton Abbot		H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Depot Buildings, West-street	Deal U.D.C.	T. C. Golder, Surveyor, 23, Queen-street, Deal	do.
School and House, Barrow-on-Soar	H. Perkin's School Governors	Barrowcliff & Allcock, Architects, Mill-street, Loughborough	do.
*Stone, Kerb, &c.	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames	do.
Pipe Sewers, &c.	Sutton Coldfield Corporation	W. A. H. Clarey, Civil Engineer, Town Hall, Sutton Coldfield	June 21
Church and Schools, Basingstoke		T. E. Davidson, Architect, 68, Aldersgate-street, E.C.	do.
Additions to Ardgye House, Alves, N.B.		Reid & Wittet, Architects, Elgin	do.
Villa, Wyke-road, Gillingham		Freame & Light, Gillingham	do.
Two Villas, Mount Charles, St. Austell		R. J. Vivyan, Moorland-road, St. Austell	do.
Cottage, Fentonladock, Cornwall		G. Gow, Tregathnan Office, Truro	June 22
Main Sewers, &c.	Alford (Lincs) U.D.C.	F. Massie, Civil Engineer, Tetley House, Wakefield	do.
Alterations, &c., at Workhouse	Omagh Union Guardians	J. L. Donnelly, Architect, Omagh	do.
Additions to Chapel, Bedlinog, Wales		P. Vivian Jones, Architect, Hengoed, Wales	do.
Building Work at several Schools	Edinburgh Corporation	Mr. Wilson, 3, Queen-street, Edinburgh	do.
Post Office and House, Lelant		W. J. Ruberry, Post Office, Canonstown, Cornwall	do.
Manse, Park-avenue, Oswestry		O. Pritchard, 15, Cross-street, Oswestry	do.
Water Mains, Altham, &c.	Burnley R.D.C.	S. Edmondson, Surveyor, 18, Nicholas-street, Burnley	do.
*Tar Paving	East Ham School Board	S. Jackson, Architect, 65, Fenchurch-street, E.C.	June 24
*School Buildings	do.	B. L. Curtis, 120, London Wall, E.C.	do.
Drainage Works, West End, Southampton	South Stoneham Union Guardians	Mitchell, Son & Gutteridge, Archts., 9, Portland-st., Southampton	do.
Drainage Works, Chipping Ongar	Ongar R.D.C.	W. N. Jarvis, Surveyor, Council House, Ongar	do.
Additions, &c., to 142, St. Owen-street, Hereford	Mr. T. Hooper	E. G. Davies, Architect, 6, St. John-street, Hereford	do.
Eleven Houses, Fountain-street, Morley		W. E. Putman, Civil Engineer, Town Hall, Morley	do.
Street Works, Front-street, &c., Tantobie	Tanfield (Durham) U.D.C.	R. Heslop, Surveyor, Burnopfield, R.S.O.	June 25
Stables for 89 Horses	Bradford Coal Merchants, &c. Assoc.	Fairbank & Wall, Architects, Bank-street, Bradford	do.
Street Works, Wynd-street	Amble U.D.C.	W. Gibson, Surveyor, Amble	do.
Concrete Paving, Flags, &c	Shrewsbury Corporation	W. C. Eddowes, Surveyor, The Square, Shrewsbury	do.
Yorkshire Stone Flags, Kerbs, &c.	do.	do.	do.
*Granite, &c.	Barnet U.D.C.	See Advertisement	do.
*Road Making, &c., Works	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn	do.
Additions to Electric Lighting Station	Great Yarmouth Town Council	J. W. Cockrill, Civil Engineer, Town Hall, Great Yarmouth	do.
Public Baths, Reginald-street	Derby Corporation	J. Ward, Borough Surveyor, Babington-lane, Derby	June 26
*Drainage, &c.	Bury Corporation	See Advertisement	do.
*Granite, &c.	North Walsham U.D.C.	do.	do.
*Iron Railings	Broadstairs and St. Peters U.D.C.	do.	June 27
*Dwelling-Houses	Brighton Borough Council	Borough Engineer, Town Hall, Brighton	do.
*School	Tyldesley-with-Shakerley U.D.C.	See Advertisement	July 2
*Sewerage Works	Chester Corporation	City Engineer, Town Hall, Chester	July 8
Shop and House, Talbot-street, Maesteg		Owner, 55, Commercial-street, Maesteg	No date
School Works, Queen's Walk	Nottingham School Board	A. N. Bromley, Architect, Queen-street, Nottingham	do.
Warehouse, Stores, &c., Laisterdyke, Bradford		Kendal & Bakes, Architects, Victoria-square, Leeds	do.
Freemasons' Hall, Abbeygate-street, Colchester		C. E. Butcher, Architect, 3, Queen-street, Colchester	do.
Additions, &c., Congregational Chapel, Gwersyllt	Building Committee	J. Gummow, Architect, Egerton-street, Wrexham	do.
Waterworks, Caldicot Moor, Mon.		T. Rees, Civil Engineer, Corn Exchange Chambers, Newport	do.
Reservoir, Eccleshill, Bradford		Kendal & Bakes, Architects, Leeds	do.
*Extensions to County Asylum Buildings	Cornwall County Asylum	See Advertisement	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Road Foreman	West Ham Borough Council	200*l.* per annum	June 18
*Clerk of Works	Harrogate Corporation	3*l.* 10s. per week	June 20
*Assistant	Hull Corporation	110*l.* per annum	June 21
*Lecturer in Building Construction	Norwich Technical Institute	150*l.* per annum	June 22
*Road Foreman	Slough U.D.C.	30s. per week	do.
*Assistant Sanitary Inspector	Willesden U.D.C.	100*l.* per annum	June 25
*Surveyor and Inspector of Nuisances	Leatherhead U.D.C.	250*l.* per annum	July 1
*Clerk of Works		See Advertisement	No date
*Clerk of Works	Cressing School Board		do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.		
Quoins, Bullnose, and Flats	14	0	0	per 1,000 at railway depôt.	
Double Stretchers	15	0	0	,,	,,
Double Headers	14	0	0	,,	,,
One Side and two Ends	15	0	0	,,	,,
Two Sides and one End	15	0	0	,,	,,
Splays, Chamfered, Squints	14	0	0	,,	,,
Seconds Quality White and Dipped					
Salt Glazed	2	0	0	,,	less than best

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	35	0	per ton, delivered.
Best Ground Blue Lias Lime	25	6	,, ,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	13s 6d.	per yard, delivered
Stourbridge Fire-clay in sacks,	28s. od.	per ton at rly. dpt.

STONE.

	s.	d.	
Ancaster in blocks	2	0	per ft. cube, deld. rly. depôt.
Bath ,,	1	7	,, ,,
Farleigh Down Bath	1	8	,, ,,
Beer in blocks	1	6½	,, ,,
Grinshill ,,	1	10	,, ,,
Brown Portland in blocks	2	2	,, ,,
Darley Dale in blocks	2	1½	,, ,,
Red Corsehill ,,	2	5	,, ,,
Red Mansfield ,,	2	4½	,, ,,
Hard York in blocks	2	10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	8	per ft. super. at rly. depôt
,, ,, 6 in. Rubbed Ditto	3	0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1	3	,, ,,
,, ,, 3 in. self-faced Ditto	0	9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6-in sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
,, ,, ,, 3-in. do.	1	2½	,, ,,

SLATES.

in. in.	£	s.	d.	
20×10 best blue Bangor	11	5	0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	10	15	0	,, ,,
16× 8 best ,,	6	2	6	,, ,,
20×10 best blue Portmadoc	10	18	0	,, ,,
16× 8 best blue Portmadoc	6	0	0	,, ,,
20×10 best Eureka unfading green	11	2	6	,, ,,
16× 8 ,, ,,	6	15	0	,, ,,
20×10 Permanent green	10	0	0	,, ,,
16× 8 ,, ,,	5	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	41	6	per 1,000 at rly. depôt.
Hip and valley tiles	3	7	per doz. ,, ,,
Best Broseley tiles	48	6	per 1,000 ,, ,,
Hip and valley tiles	4	0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000 ,, ,,
Do. ornamental Do.	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000 ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	16	10	0	18	0	0
Deals: best 3 by 9	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	12	0	0	13	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals seconds	0	0	less than best			
Battens: seconds	0	10	0	,, ,,	,,	
2 in. by 4 in. and 2 in. by 6 in.	9	10	0	11	0	0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	10	10	0
Foreign Sawn Boards—						
1 in. by 1¼ in. by 1½ in.		10	0	more than battens.		
¾ in.	1	0	0	more than battens.		

At per load of 50 ft.

Fir timber: Best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks	2	15	0	3	0	0
Pitch pine timber (35 ft. average)	3	10	0	4	0	0

JOINERS' WOOD.

	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.	27	10	0	28	10	0
3 in. by 9 in.	24	0	0	25	0	0
Battens, 2½ in. and 3 in. by 7 in.	20	0	0	21	0	0
Second yellow deals, 3 in. by 11 in.	22	10	0	24	0	0
,, ,, 3 in. by 9 in.	20	0	0	21	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	16	10	0	18	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	25	0	0	26	0	0
Do. 3 in. by 9 in.	22	0	0	23	0	0
Battens	16	10	0	17	10	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
Do. 3 in. by 9 in.	17	0	0	18	0	0
Battens	14	0	0	14	10	0
Third yellow deals, 3 in. by 11 in.	15	0	0	16	10	0
Do. 3 in. by 9 in.	14	0	0	14	10	0
Battens	12	10	0	13	10	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	15	10	0	16	10	0
,, ,, ,, 3 in. by 9 in.	14	10	0	15	10	0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £	s.	d.	£	s.	d.
White Sea and Petersburg:—						
Battens	12	10	0	13	10	0
Second white deals 3 in. by 11 in.	14	0	0	15	0	0
,, ,, ,, 3 in. by 9 in.	13	0	0	14	0	0
,, ,, battens	11	0	0	12	0	0
Pitch pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—						
First, regular sizes	30	0	0	33	0	0
Broads (12 in. and up)	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—						
Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	0
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	7
in. do. do.	0	0	7	-	-	-
Dry Mahogany—						
Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks—						
Per ft. cube	0	2	3	0	3	0

Prepared Flooring—	Per square.					
1 in. by 6 in. and 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 6 in. and 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0	16	0	1	1	0
1 in. by 6 in. and 7 in. white, planed and shot	0	11	0	0	13	0
1 in. by 6 in. and 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 6 in. and 7 in. white, planed and matched	0	14	0	0	16	6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	15	0	8	15	0
Compound Girders ,, ,,	9	10	0	10	15	0
Angles, Tees and Channels, ordinary sections	9	7	6	11	7	6
Flitch Plates	9	15	0	10	10	0
Cast Iron Columns and Stanchions, including ordinary patterns	8	5	0	10	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON.—						
Common Bars	8	10	0	9	0	0
Staffordshire Crown Bars, good merchant quality	9	0	0	9	10	0
Staffordshire "Marked Bars"	11	10	0	-	-	-
Mild Steel Bars	9	0	0	10	0	0
Hoop Iron, basis price	9	10	0	10	0	0
,, ,, galvanised	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.—						
Ordinary sizes to 20 g.	10	5	0	-	-	-
,, ,, to 24 g.	11	10	0	-	-	-
,, ,, to 26 g.	12	15	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	10	0	-	-	-
Sheet Iron, galvanised, flat, best quality.—						
Ordinary sizes to 20 g.	16	10	0	-	-	-
,, ,, 22 g. and 24 g.	17	0	0	-	-	-
,, ,, 26 g.	18	10	0	-	-	-
Galvanised Corrugated Sheets.—						
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	15	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	10	0	-	-	-
,, ,, 26 g.	14	10	0	-	-	-
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	10	10	0	-	-	-

PLASTER, &c.

	s.	d.	
Coarse Plaster	30	0	per ton delivered.
Fine ,,	32	0	,, ,,
Coarse Keenes and Parian cement	51	6	,, ,,
Fine do. do.	59	6	,, ,,
Robinson's Fireproof Cement	51	6	,, ,,
Do. Finishing ,,	56	6	,, ,,
(Exclusive of the ordinary charge for sacks.)			
Whiting	30	0	,, ,,

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	15	5	0	-	-	-
Pipe in coils	15	15	0	-	-	-
Soil Pipe	18	5	0	-	-	-
ZINC—Sheet—						
Vieille Montagne ton	24	0	0	-	-	-
Silesian	23	10	0	-	-	-
COPPER—						
Strong Sheet per lb.	0	1	0½	-	-	-
Thin ,,	0	1	2	-	-	-
Copper nails ,,	0	1	2	-	-	-
BRASS—						
Strong Sheet ,,	0	0	11	-	-	-
Thin ,, ,,	0	1	1	-	-	-
TIN—English Ingots ,,	0	1	4	-	-	-
SOLDER—Plumbers' ,,	0	0	7	-	-	-
Tinmen's ,,	0	0	8	-	-	-
Blowpipe ,,	0	0	9	-	-	-

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	3d.	per ft. delivered.	
,, fourths	2¾d.	,,	,,
21 oz. thirds	3¾d.	,,	,,
,, ,, fourths	3½d.	,,	,,
26 oz. thirds	5d.	,,	,,
,, ,, fourths	4½d.	,,	,,
32 oz. thirds	6d.	,,	,,
,, ,, fourths	5½d.	,,	,,
Fluted sheet, 15 oz.	3½d.	,,	,,
,, ,, 21 ,,	4½d.	,,	,,
½ Hartley's Rolled Plate	3d.	,,	,,
⅝ ,, ,, ,,	3½d.	,,	,,
¾ ,, ,, ,,	4d.	,,	,,

OILS, &c.

	£	s	d.	
Raw Linseed Oil in pipes	0	3	0	per gallon
,, ,, ,, in barrels	0	3	1	,,
,, ,, ,, in drums	0	3	3	,,
Boiled ,, ,, in pipes	0	3	2	,,
,, ,, ,, in barrels	0	3	3	,,
,, ,, ,, in drums	0	3	5	,,
Turpentine, in barrels	0	2	5	,,
,, in drums	0	2	7	,,
Genuine Ground English White Lead	23	10	0	per ton
Red Lead, Dry	24	0	0	,,
Best Linseed Oil Putty	0	9	0	per cwt.
Stockholm Tar	1	10	0	per barrel

VARNISHES, &c.

	per gallon £	s.	d
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	6
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	0
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	9	0
Berlin Black	0	15	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

J. P. B. (Received too late). S. T. (Amounts should have been stated). E. B. (Too late: next week).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BRIDLINGTON QUAY.—For alterations to No. 30, King-street, for Mr. J. R. Collinson. Mr. J. Earnshaw, architect, Bridlington Quay:—

E. Corner	£165 0	S. Atkin	£110 0
F. Kneeshaw	123 14	Barr & Booth	106 0
C. Simon	118 0	A. Gardam*	100 10
F. Flintoft	115 0		

[All of Bridlington.]

BUCKERELL (Devon).—For the erection of a house, for Mr. A. M. Read. Mr. E. H. Harbottle, architect, County Chambers, Exeter. Quantities by Mr. F. E. Simpson, Heavitree, near Exeter:—

Luscombe & Son	£2,692 0 0	C. Turner	£1,923 0 0
E. Harris	2,265 15 0	W. J. Grainger	1,880 0 0
Mings & Boon	2,101 0 0	Nicks Bros., Bradninch*	1,854 19 0
Stephens & Son, Ltd.	1,975 0 0		

BUCKNELL (Salop).—For additions to schools for the managers, Bucknell Schools. Mr. T. Evans, architect, Market Buildings, Craven Arms. Quantities by architect:—

G. Bullock	£189 0	Weale & Lloyd	£163 5
W. Cadwalladar	179 0	Anthony & Roberts, Knighton*	157 0
Overton & Sons	176 0		

[Architect's estimate £180]

CARLISLE.—For the erection of stabling, stores yard, workshops, &c., for the Corporation. Mr. H. C. Marks, C.E., City Engineer and Surveyor, 36, Fisher-street, Carlisle. Quantities by City Engineer and Surveyor:—

Tom Scott	£4,881 1 7	James Beaty	£4,455 0 0
George Black	4,794 16 3	Joseph Hindson	4,430 0 0
Beaty Bros.	4,660 0 0	John H. Reed	4,369 0 0
Wm. Baty	4,507 0 0	J. & R. Bell, Carlisle*	4,361 0 0
John Laing	4,485 0 0		

[Surveyor's estimate, £4,551.]

| *See also next page.*

CHATHAM.—For the erection of laundry buildings, Boster's Hill. Mr. H. H. Dunstall, architect, 9, New-road-avenue, Chatham. Quantities by the architect:—

W. C. Snow	£1,519	Corke	£1,248
G. West	1,325	H. E. Phillips	1,245
West Bros.	1,324	Trueman & Son, Chatham*	1,219
W. Coker	1,322		

EASTBOURNE.—For alterations at the Town Hall, for the Corporation. Mr. W. C. Field, Borough Architect and Building Surveyor, Town Hall, Eastbourne:—

Thomas Glover	£320 0 0	Mark Hookham Springfield-rd., Eastbourne*	£219 12 0
Dennis & Co.	263 0 0		
Cole & Son	250 18 6		
W. Llewellyn	249 0 0		

EDGWARE (Middlesex). — For the erection of teachers' houses and caretakers' rooms, High-street, for the School Board. Mr. J. Hudson, architect, 23, York-place, Baker-street, W. Quantities by architect:—

Talmond & Sons	£1,995 0 0	W. Tout	£1,893 10 0
W. Bailey	1,965 0 0	Wilson Bros.	1,831 0 0
Foster Bros.	1,937 0 0	Dupont & Co., Watford*	1,697 0 0
J. Christie	1,897 0 0	F. Hodges	1,655 10 7

FALMOUTH.—For the erection of business premises, Porhan-road, for Messrs. J. Grose & Sons. Mr. W. Swift, architect, 4, Princes-street, Truro:—

Goddard & Farley	£969	J. S. Kelway, Falmouth*	£659
E. H. Moss	940		
G. Miners	893		

ILFORD.—For alterations, &c., at the London and Provincial Bank, High-street, Ilford, E. Mr. Fred. A. Ashton, architect, 177, Romford-road, Stratford, E.:—

G. Sharpe	£265	G. T. R. Hammond*	£247
G. Lewin	258		

LONDON.—For roads and sewers, St. Ann's Estate, Barnes, S.W. Messrs. F. & W. Stocker, auctioneers and surveyors, 90 and 91, Queen-street, E.C.:—

Wilson, Border, & Co.	£2,580 18 9	J. Mears	£1,714 0 0
G. Porter	2,394 10 0	W. H Wheeler	1,689 0 0
Killingback & Co.	2,197 0 0	J. Jackson	1,610 10 0
S. Kavanagh	1,991 0 0	S. Saunders	1,600 0 0
Greenham	1,990 0 0	T. Adams	1,593 0 0
E. Fry	1,942 0 0	W. Langridge	1,563 0 0
Wimpey & Co.	1,935 0 0	J. Jackson	1,539 10 0
Lawrence & Thacker	1,883 0 0	Bentham & Co.	1,506 0 0
Woodham & Sons	1,873 0 0	H. Boyer	1,495 0 0
T. Guff	1,810 2 2	H. Williams	1,433 6 7
G. Wilson	1,765 0 0	G. Bell	1,348 0 0
Nowell & Co.	1,746 0 0	Parry & Co.	1,330 0 0
		W. Wilson	1,250 0 0
		J. King, Kilburn*	1,204 7 8

LONDON.—For erection of electric lighting station, Tottenham-lane, Hornsey, for the Hornsey District Council:—

F. G. Minter	£16,970	Willmott & Sons	£15,990
Lole & Lightfoot	16,941	Wilkinson Bros.	15,951
Munday & Sons	16,658	F. & E. Davey	15,495
C. G. Hill	16,500	Braid, Pater, & Co., Bow Churchyard, Cheapside*	13,777
J. Christie	16,360		
Gregar & Son	16,183		
Lawrence & Son	15,999		

LONDON.—For dilapidations, &c., at the Victoria Tavern public-house, Burdett-road, E., for Messrs. Holt & Co. Mr. Fred. A. Ashton, architect, 177, Romford-road, Stratford, E.:—

A. Kendall	£168	T. & H. Selby*	£129
J. & H. Cocks, Ltd.	155		

NEWCASTLE-ON-TYNE. — For alterations to car sheds, &c., Haymarket and Gosforth, for the Corporation. Mr. A. E. Le Rossignol, engineer, Pandon Buildings, Newcastle:—

Haymarket Car Sheds.

R. Veitch, Newcastle* £5,178 14 1

Gosforth Car Sheds.

R. Veitch, Newcastle* £3,646 18 11

NORTH SHIELDS.—For the erection of club buildings, Albion-road, for the Tynemouth Conservative Club Company, Ltd. Mr. F. R. N. Haswell, architect, Tyne-street, North Shields:—

R. Langlands	£4,595 10 8	W. T. Weer	£4,300 0 0
J.&W.Simpson	4,400 0 0		

SEND (Surrey).—For new entrance lodge, stable, fives court, &c., for Mr. Wm. May. Mr. Sam. Ridgeway, C.E., architect, Maybury Hill, Woking:—

Entrance Lodge.

G. Kyle ..... £340 | G. Goring, Woking* .. £286

Stable, Fives Court, &c.

G. Goring ..... £480 | G. Kyle, Ripley* £425

STRATFORD. — For alterations at the Woodman, High-street, Stratford, E., for Mr. C. Oxford. Mr. J. M. H. Gladwell, architect, 34, Lawrence-road, Bow, E.:—

A. E. Symes	£555	J. & H. Cocks, Ltd.	£452
C. F. W. Crampton	498	S. Salt*	410

TAMWORTH.—For rebuilding the Globe Inn, Gungate, Tamworth, for Messrs. Fred. Smith & Co., Aston Model Brewery, Birmingham. Mr. James William Godderidge, architect, Tamworth. Quantities by the architect:—

Clarson & Son	£2,497	E. Williams, Tamworth*	£2,297
B. Musson	2,335		

[Architect's estimate, £2,357.]

TUTBURY. — For the erection and completion of manager's and foreman's houses, and four cottages, at Tutbury, for Mr. Henry Newton, Burton-on-Trent, Mr. R. Stevenson, architect, Imperial Chambers, High-street, Burton-on-Trent. Quantities by the architect:—

H. Edwards	£2,402 0 0	W. Gould	£2,190 9 6
G. Hodges	2,252 0 0	Lowe & Sons, Burton-on-Trent*	2,185 0 0
W.A.Stevenson	2,231 0 0		
R. Kershaw	2,199 0 0		

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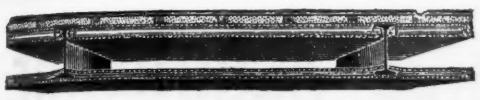

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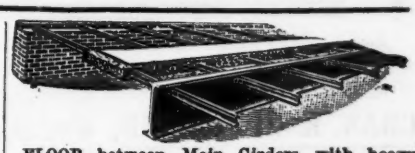

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Driver Prize	1895	1896	—	1898	1899	1900	1901
Penfold Silver Medal	1895	1896	—	1898	1899	1900	1901
Penfold Gold Medal	—	—	—	—	1899	1900	—
Crawter Prize	—	—	—	1898	—	—	1901

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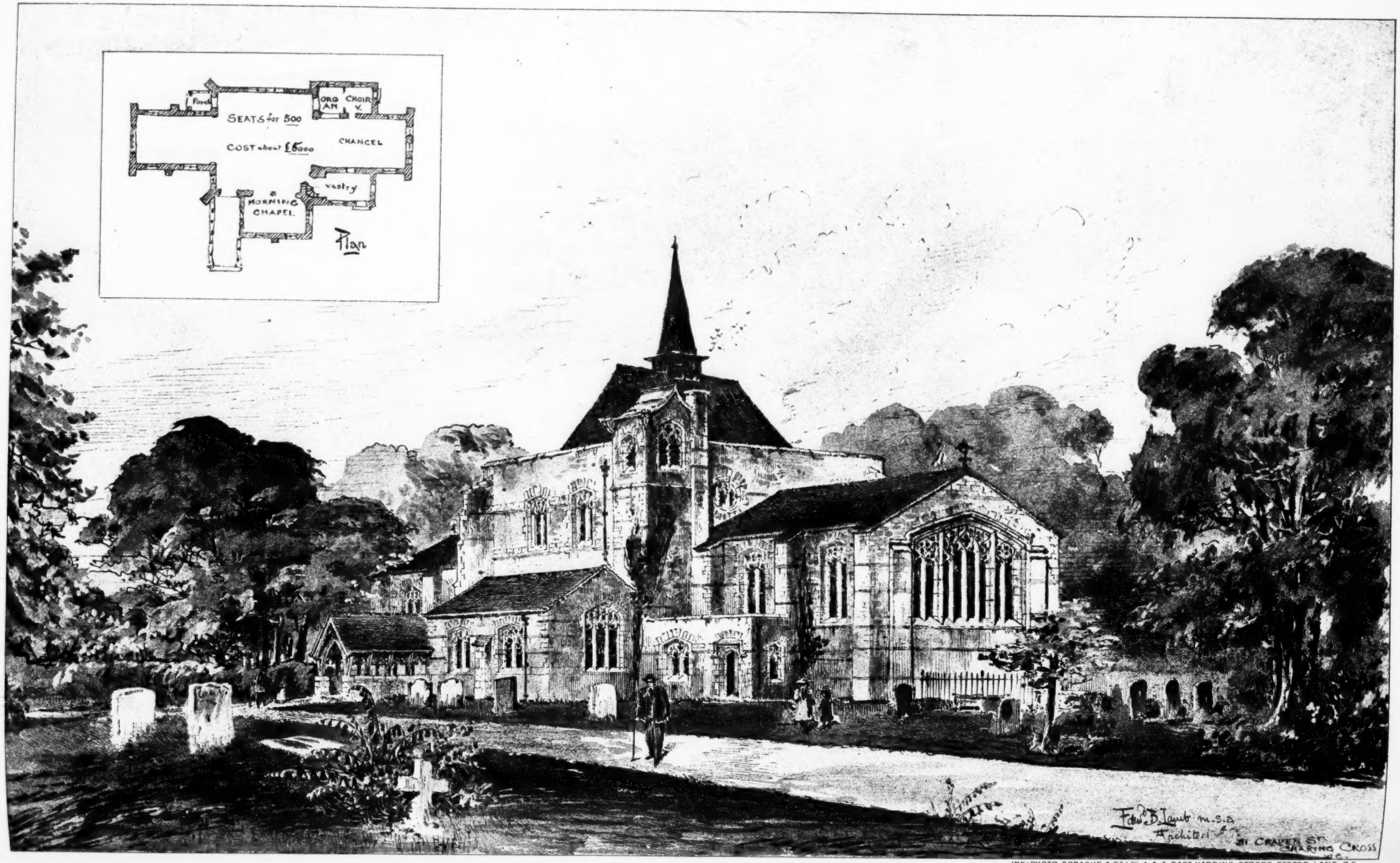
Previous experience at undertakings of similar nature and extent indispensable.
Form of application for appointment may be obtained by sending stamped directed envelope to the Clerk to the Council, T. M. STURGESS, 5, St. Nicholas'-buildings, Newcastle-on-Tyne.



INK-PHOTO, SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR A COUNTRY CHURCH (500 SEATS).—MR. E. B. LAMB, ARCHITECT.

DESIGN FOR A COUNTRY CHURCH (500 SEATS).—MR. E. B. LAMB, ARCHITECT.

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"SUMMER": BAS-RELIEF TO BE EXECUTED IN TERRA COTTA AS A DECORATION TO A BUILDING.
MR. F. E. E. SCHENCK, SCULPTOR.

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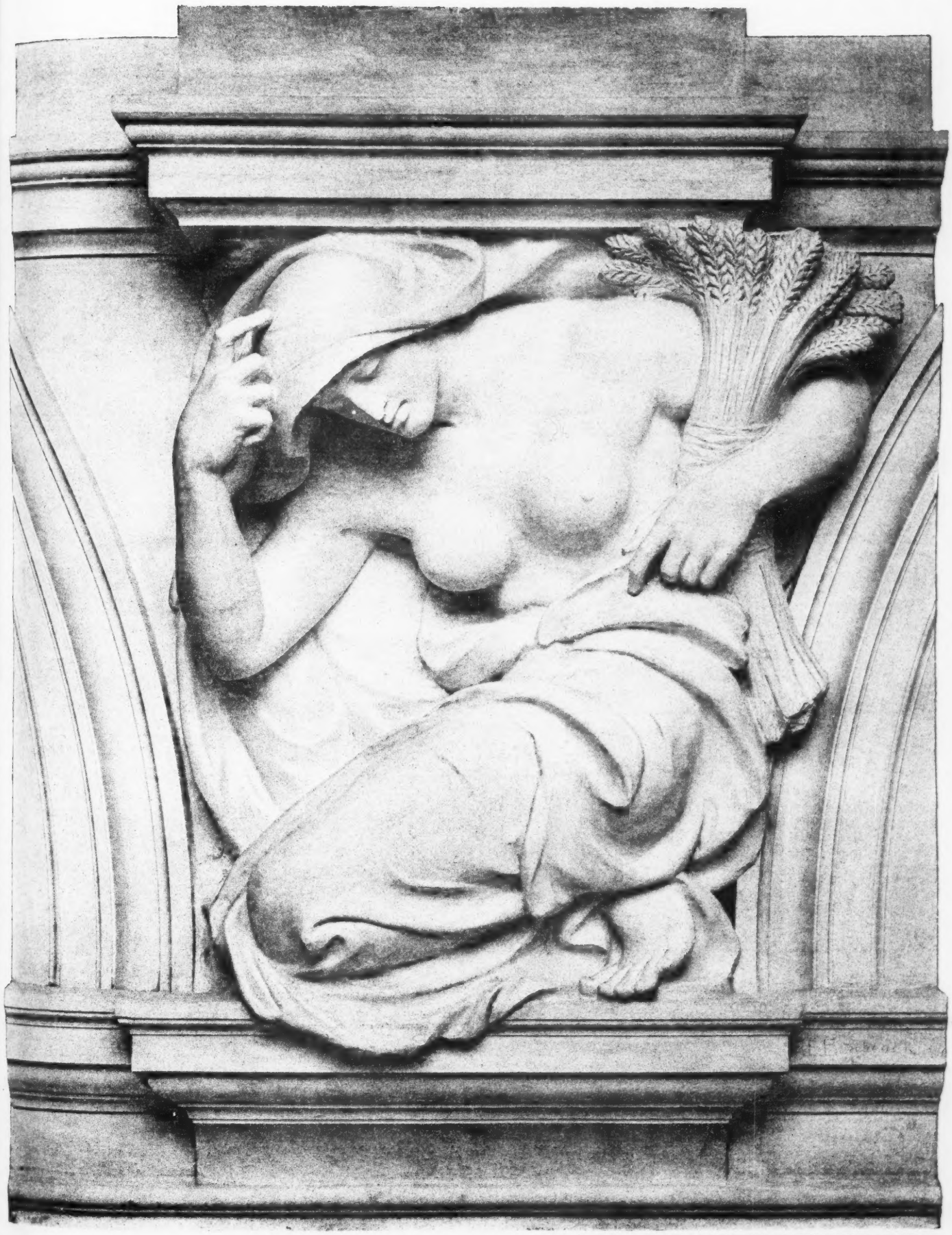

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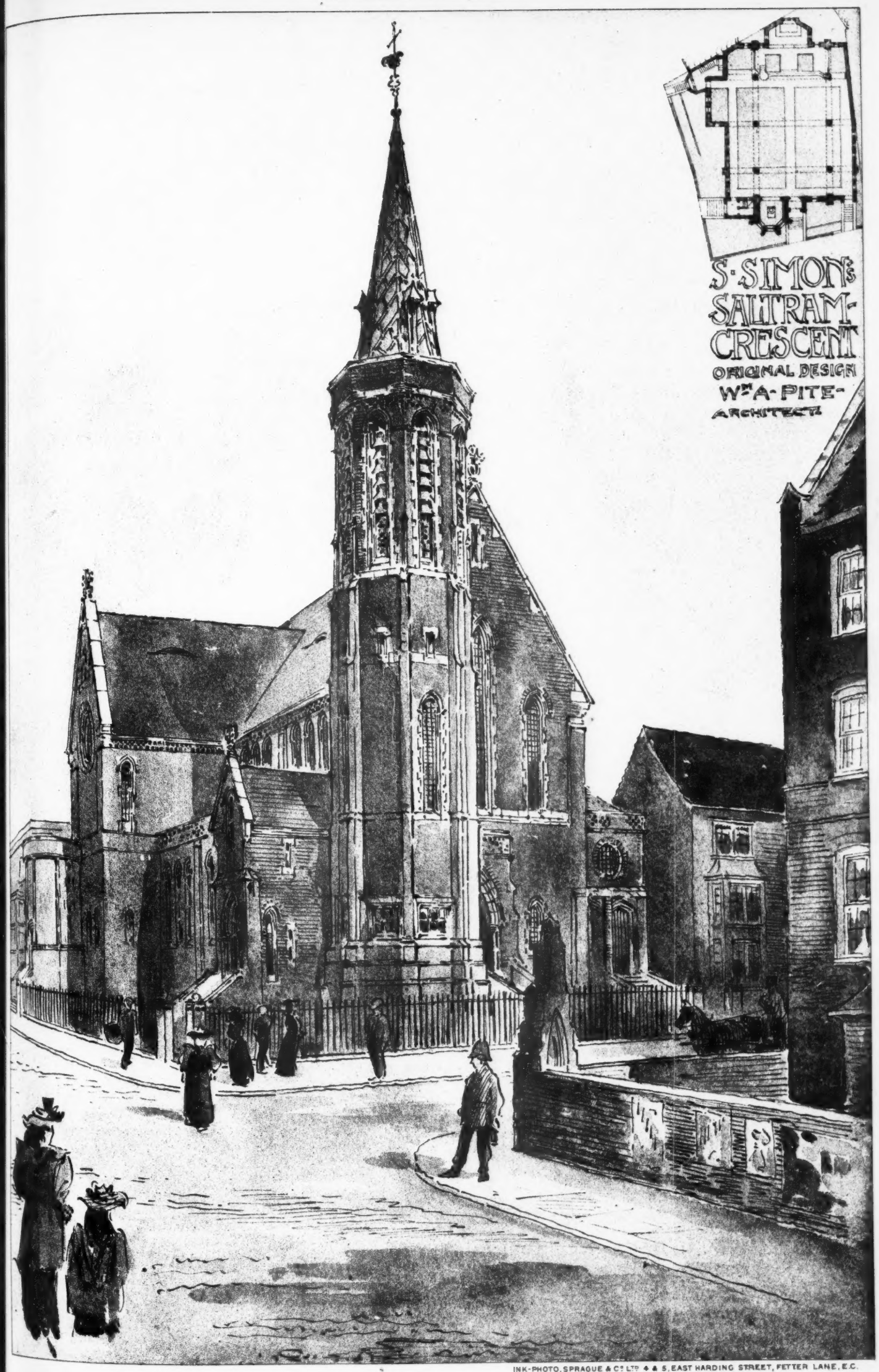
"AUTUMN": BAS-RELIEF TO BE EXECUTED IN TERRA COTTA AS A DECORATION TO A BUILDING.
MR. F. E. E. SCHENCK, SCULPTOR.



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"SOLITUDE" (M. ADOLPHE MÉGRET).

"PANDORA" (MISS L. GWENDOLEN WILLIAMS).

UPPER PART OF A CABINET IN OAK

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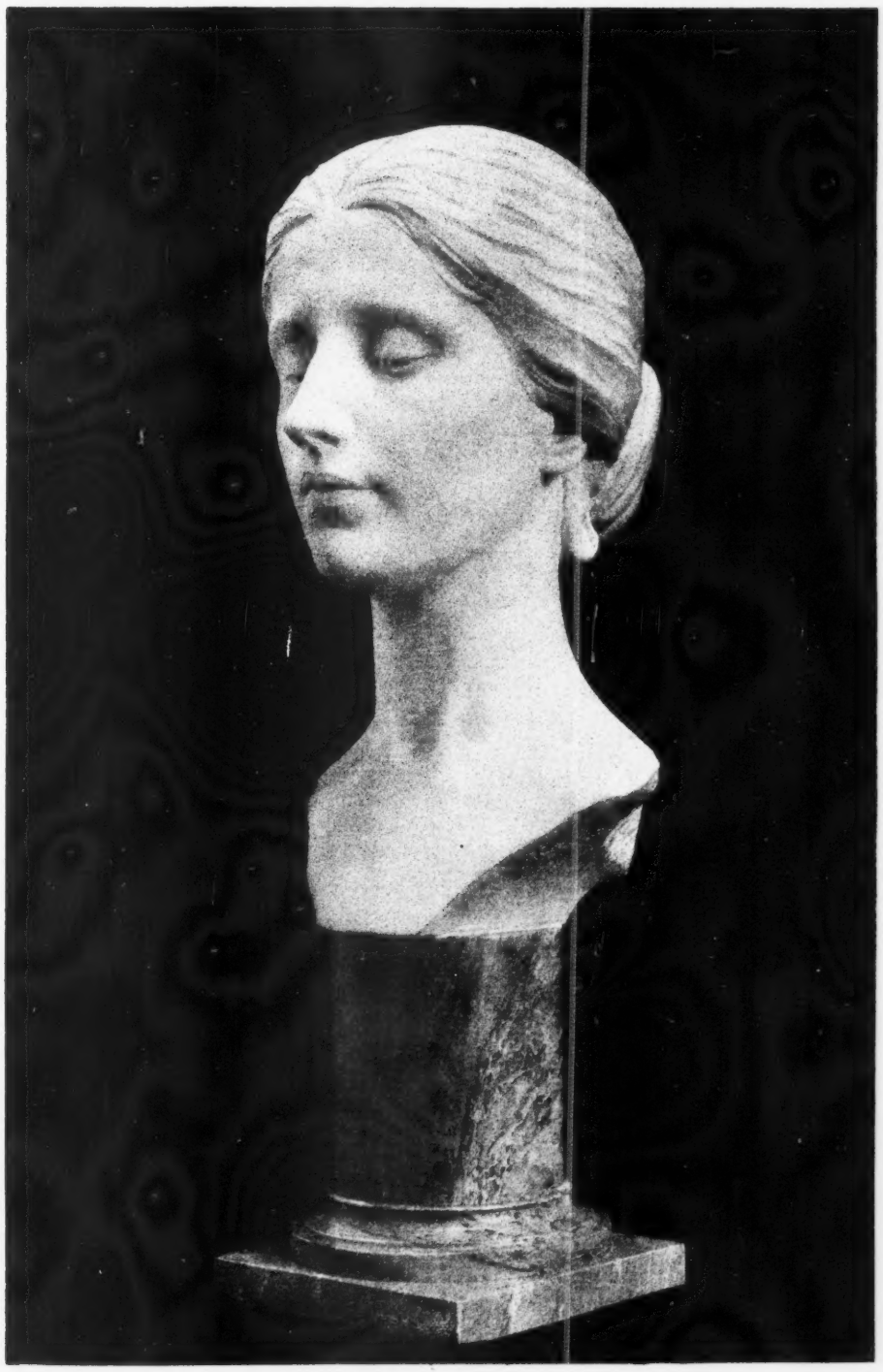
"AWAKENING" (Mr. Oliver Wheatley).

IN OAK ...R. Mark Rogers, Jun.).



"L'INCONNUE" (Mr. Richard Garbe).

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JERVSALEM
1550 A.D.
القدس الشريف

Bab el Amud
Bab ez Zahireh
Dervish Mosque
Mosque
Mosque
Ancient ch. of S. Anne afterwards the Mosque School
Mosque
Bab Sitti Mariam
Tarik Sitti Mariam.
Ecce homo.
Tarik Bab el Hamud.
Bab el Atem.
Bab el Asbat.
Kankar Mosque.
S. Salvator (Casa Nova)
Mediaeval wall.
S. Sepulchre
Mosque & Convent.
Bab en Nazir.
Suk es Semsani
Haret en-Nasara.
Mosque Omar.
S. Mar. maj.
S. Mar. min.
Suk el Lattamin.
Suk el Attarin.
S. Johannes
Suk el Kattanin.
Sakhra
Bab ed Dahariyeh
Bab el Khalil
Tower of Hippicus
Tower of Phasael
Tower of Mariamne

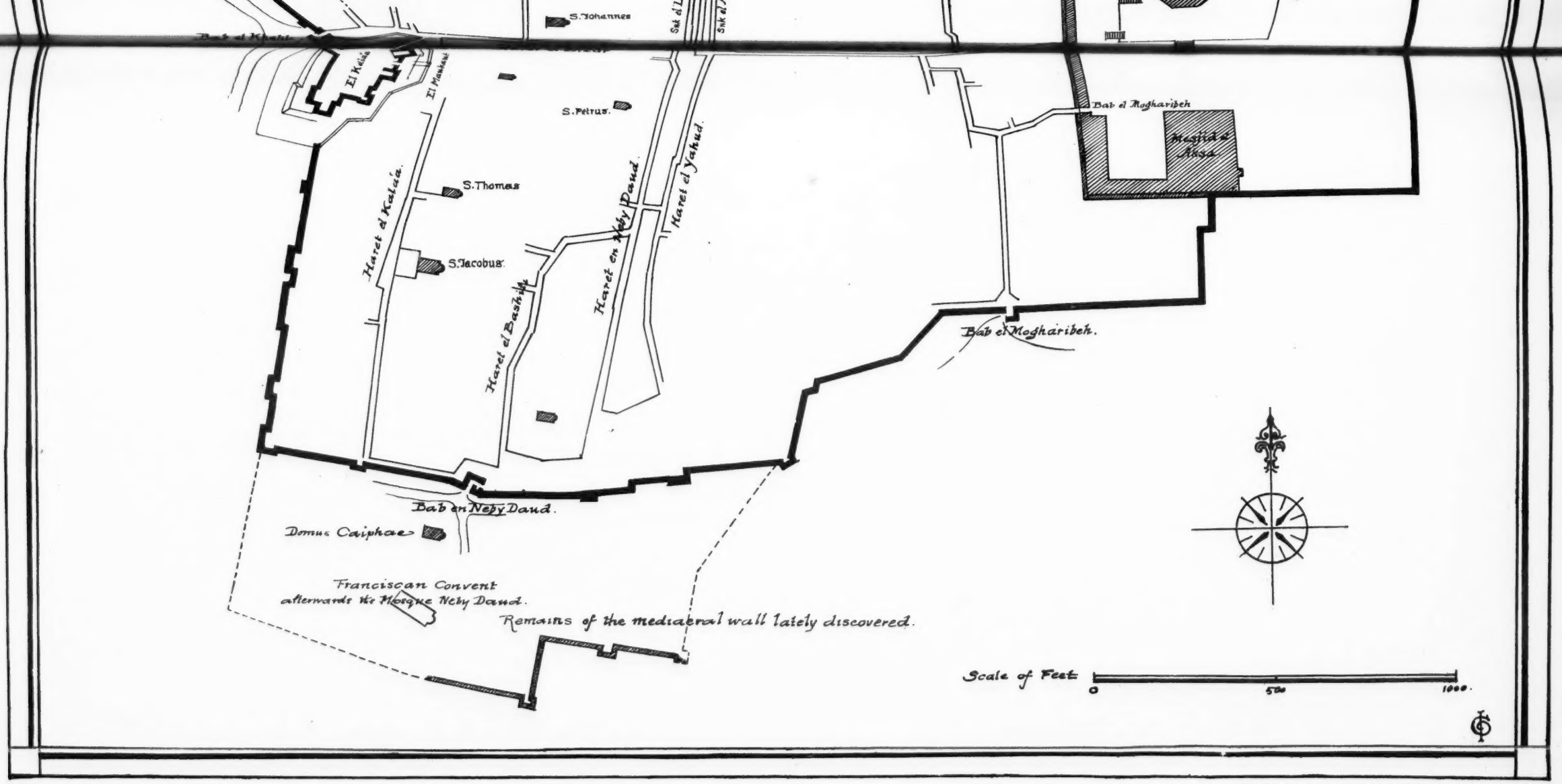

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET, FETTER LANE, E.C.

THE MODERN WALLS OF JERUSALEM.—From a Plan by Mr. Geo. Jeffery, Architect.

(See first article in this issue).